BRITISH MEDICAL JOURNAL

LONDON: SATURDAY, JANUARY 18th, 1936

THE INCIDENCE OF PLEURAL EFFUSION IN ARTIFICIAL PNEUMOTHORAX

WITH SPECIAL REFERENCE TO MEDICAL TREATMENT*

BY

DAVID B. ROSENTHAL, M.D., B.S.MELB.

MEDICAL SUPERINTENDENT, GRESSWELL SANATORIUM, MONT PARK, VICTORIA

The number and variety of purely medicinal measures advocated in the treatment of pulmonary tuberculosis are themselves indicative of the uncertainty of the results obtained from their use. Recent developments in thoracic surgery, from the modest artificial pneumothorax to the drastic thoracoplasty, have placed in our hands valuable weapons which, however, must be wielded with care to prevent the abuse that so frequently brings useful remedies and lines of therapy into undeserved disrepute. Over the last fifteen years artificial pneumothorax has been steadily finding its correct place in the armamentarium of the physician dealing with diseases of the chest. Undoubtedly, in the early period, the treatment was applied to many cases that were unsuitable. More latterly, the swing of the pendulum has brought us back to a point at which rational appreciation of the limitations of this line of treatment is manifest. Limitations of the application of artificial pneumothorax in the treatment of pulmonary tuberculosis depend on two factors: (1) the stage of the disease, and (2) complications that may arise, due in part at least to the treatment itself. Of these complications, the commonest, and the most upsetting to both the patient and the physician, is the development of a pleural effusion, and it is the purpose of this paper to examine this aspect of the subject.

It has been claimed that benefit may follow the development of a pleural effusion, due to the combined results of mechanical action and serological effects.[1] Personally, I have not observed a case in which any benefit was at all clearly defined, although occasionally a patient may volunteer "feeling better" after the upset associated with the appearance of fluid has worn off. Whilst the presence of pleural fluid in a pneumothorax cavity may be attended by no untoward effects, three undesirable sequelae may be considered.

1. Great thickening of the pleura, preventing satisfactory re-expansion of the lung later. This attains the extreme form in the condition of "opaque pneumothorax."[2]

2. Premature obliteration of the artificial pneumothorax space by organization of the fibrin in the fluid. (In one case under the observation of Dr. H. James and myself this occurred within the short period of two months from the appearance of a small effusion filling the costophrenic angle, in a well-established artificial pneumothorax.)

3. The fluid may become purulent.

Undoubtedly an uncomplicated artificial pneumothorax is a great boon to the sufferer. The development of fluid introduces an element of uncertainty and danger—at best, it is useful only in helping to maintain the collapse of the lung, and thereby lessening the frequency of refills, an effect beyond control; at worst, it is the precursor of a tuberculous pyothorax.

The numerical incidence of this complication is here reviewed both from a perusal of the literature generally and from a detailed examination of a series of fifty-four cases that have been under my care throughout their course. Admittedly the series is a small one. It includes only cases of pulmonary tuberculosis in which an artificial pneumothorax was induced as a therapeutic measure, and the following cases have been excluded from the review: (1) where artificial pneumothorax was induced for diagnostic purposes; (2) where artificial pneumothorax was established after aspiration of a pleural effusion already present; and (3) where pleural effusion has followed the deliberate insertion into the pleural space of an irritant, such as gomenol, for the purpose of controlling mediastinal displacement or pleural hernia. Detailed pathological examination of the fluid obtained by aspiration was not undertaken.

An attempt has been made to assess the various aetiological factors which may have, either singly or together, played a part in the development of fluid, and the thesis is here advanced that trauma to the pleura, in one way or other, is the main provocative cause.

Reported Incidence of Effusions

Even a cursory examination of the literature shows that there exists a great variation in opinion regarding the frequency of pleural effusion complicating artificial pneumothorax. The discrepancy is partly due to the deliberate exclusion from their figures by some observers of those cases in which only a very small effusion was observed.

Burrell[3] reports a series of 309 cases treated by artificial pneumothorax, in which pleural effusion occurred in 128 patients—that is, in 42 per cent. This figure includes only those in which the presence of fluid was observed for at least a week, and in which the fluid covered the diaphragm. He considers that all cases probably develop at least a small transient effusion during the course of an artificial pneumothorax. Of these 128, pus developed in thirty-six cases. In another series of 500 cases, Burrell experienced effusion in 177 (35 per cent.), of which a little over one-third became purulent.

* Read in opening a discussion in the Section of Public Medicine at the Annual Meeting of the British Medical Association, Melbourne, 1935.

Figures quoted by Burrell[1] include:

Riviere—expected effusion in about 50 per cent.

Dumarest and Brette—70.38 per cent. of 265 cases (includes small effusions).

Saugman—67.2 per cent. in 238 cases.

Weinstein—70 per cent. of advanced cases; 33 per cent. of moderately advanced cases; and 10 per cent. of mild cases.

Rist and Naveau—52 per cent. cases (excludes small transient effusions).

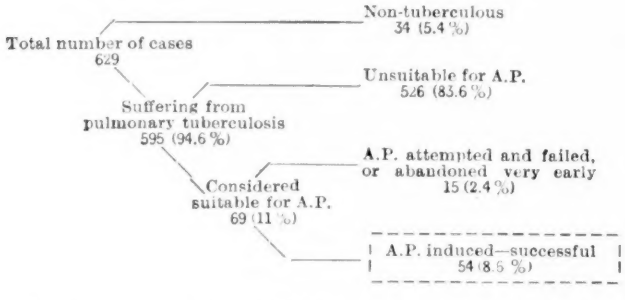
Brauns—only 5 per cent. of a series of ninety-eight cases.

Morriston Davies[4] considers that effusion will occur within twelve months in at least 50 per cent. of cases. James[5] mentions the occurrence of effusion in only two cases of a series of forty—that is, 5 per cent.—and remarks that the normal expectation is about 40 per cent. Sachs[6] records a batch of 800 cases of artificial pneumothorax, without the occurrence of a single case of empyema! Trail[7] reports a series of eighty cases, in which one-half developed pleural fluid; in five of these forty the fluid became purulent. He expresses the generally accepted opinion that when pyothorax does not supervene the presence of fluid seldom has a bad effect on the ultimate result of artificial pneumothorax.

Enough has been quoted to indicate that the proportion of affected cases averages about one-half, but until some more careful standardization of results is attempted any accurate forecast will be impossible. With reference to empyema, the incidence appears to vary from one in eight to one in four of those cases that have developed fluid—that is, from 5 to 10 per cent. of patients in whom artificial pneumothorax has been established.

Review of Cases

During the two years from April, 1933, to March, 1935, the number of patients admitted to Gresswell Sanatorium was 629, of whom fifty-four received artificial pneumothorax therapy for the treatment of pulmonary tuberculosis. This is clearly shown in the diagram below.

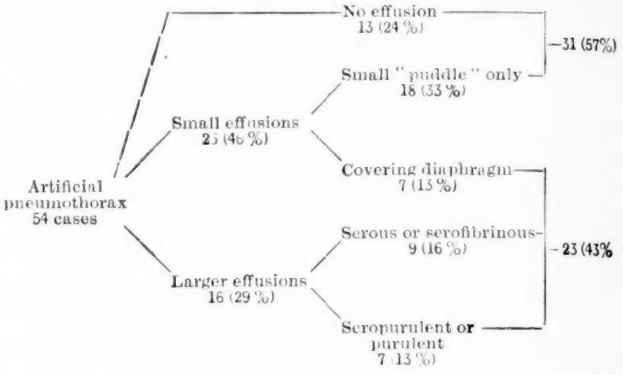

Total number of cases 629
Non-tuberculous 34 (5.4 %)
Unsuitable for A.P. 526 (83.6 %)
Suffering from pulmonary tuberculosis 595 (94.6 %)
A.P. attempted and failed, or abandoned very early 15 (2.4 %)
Considered suitable for A.P. 69 (11 %)
A.P. induced—successful 54 (8.5 %)

It is proposed to consider in detail these fifty-four patients with special reference to the occurrence of pleural effusion.

The second diagram shows the number of patients with and without fluid, and for the sake of clarity a special group has been made of those who developed only a small "puddle" of fluid in the costophrenic angle, which occasionally persisted for a very short time only. Without the aid of frequent screening, these would all have been considered as being "without fluid." Thirteen cases showed no fluid at all, although it is recognized that a very small effusion may have appeared and vanished between successive screenings. Some of these patients have been under observation for more than twenty months. This group forms 24 per cent. of the whole. The number of patients who developed a small effusion, sufficient to fill only the costophrenic angle, was eighteen—that is, 33 per cent. In a few of these the "puddle" persisted for many weeks—occasionally for months—with small variation of the quantity of fluid. It will be noted that these first two groups include 57 per cent. of the total—that is, no effusion of any clinical significance occurred in more than one-half of the cases under review.

The third group consists of the cases in which the quantity of fluid, whilst not sufficient to necessitate aspiration, was great enough to affect the intrapleural pressure, and so modify the routine of refills. The presence of fluid was appreciated by the patient, and could be detected by ordinary clinical examination. At least one aspiration was done in each of these cases to determine the nature of the fluid, which was always serous.

The fourth and fifth groups consist of sixteen cases which needed more active treatment. Some of these


Artificial pneumothorax 54 cases
No effusion 13 (24 %)
Small "puddle" only 18 (33 %)
31 (57%)
Small effusions 25 (46 %)
Covering diaphragm 7 (13 %)
Serous or serofibrinous 9 (16 %)
23 (43%
Larger effusions 16 (29 %)
Seropurulent or purulent 7 (13 %)

appeared to develop large effusions rapidly, whilst others graduated to their present position in the classification from the second and third groups over a fair interval of time. Of the seven cases of pyothorax, four were successfully treated by conservative methods, one had a thoracoplasty, and two died.

In summarizing, it will be seen that forty-one out of the fifty-four cases developed effusion—76 per cent. If we exclude those in which only a very small "puddle" of fluid, filling the costophrenic angle, formed, the number of effusions was twenty-three, or 43 per cent. of the total.

The presence of adhesions in each case has been carefully looked for, both by fluoroscopy and by examination of radiograph, it being felt that the presence of fluid might be related to this factor.

The occurrence of a febrile reaction at the time of the appearance of the effusion was in each case carefully noted in an attempt to assess the infective, as distinct from the traumatic, factor in the causation of the effusion. It is recognized that these are not mutually exclusive, and that the presence of fever at the time does not exclude trauma, to which it may have been secondary. Table I shows the number of cases with adhesions, and with a febrile reaction at the onset of effusion, in each group.

TABLE I

Group	Adhesions Present in—	Temp. Elevated at Onset of Effusion in—
1. No fluid; 13 cases... ...	9 cases (69 per cent.)	—
2. Small "puddle"; 18 cases	16 „ (90 „)	1 case (5 per cent.)
3. Fluid covers diaphragm; 7 cases	5 „ (70 „)	1 „ (14 „)
4. Larger effusion (serous or S.F.); 9 cases	9 „ (100 „)	6 cases (66 „)
5. Larger effusion (purulent or S.P.); 7 cases	7 „ (100 „)	6 „ (85 „)

It is manifestly difficult to draw any conclusions from these small numbers, but there is a suggestive association between the occurrence of fluid and the presence of adhesions, particularly in Groups 2, 4, and 5. The comparison of Groups 1 and 3 shows that other factors are

also concerned. Notable, too, is the infrequency of febrile reaction in Groups 2 and 3, and its frequency in Group 5. It is interesting to observe that adhesions of some degree were present in forty-six of the fifty-four cases—85 per cent. These ranged from fine strands to massive bands holding the lung to the chest wall over a considerable area.

Table II presents, in a different way, the association of the presence of adhesions with the development of pleural effusion.

TABLE II

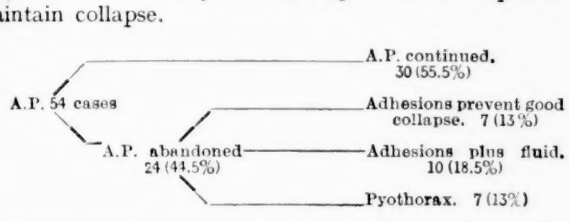
	No Adhesions	Adhesions Present
No fluid	4 (7.4 per cent.)	9 (16.6 per cent.)
Fluid present. Groups 2, 3, 4 and 5	4 (7.4 ,,	37 (68.5 ,,)

With reference to the time that elapsed from the establishment of the artificial pneumothorax until the appearance of fluid, examination of the figures discloses no suggestive feature, except the tendency to earlier appearance in Groups 2 and 5, the least and most important respectively. Wide variation is noted—from one week to sixty-four weeks. Table III summarizes these figures.

TABLE III

Group	Time of Appearance of Fluid, from Induction of A.P.	
	Average in Weeks	Minimums and Maximums
2. (18 cases)	15	1 week—40 weeks
3. (7 cases)	21	2 weeks—50 weeks
4. (9 cases)	23	2 ,, —64 ,,
5. (7 cases)	12	4 ,, —20 ,,

Finally, it is interesting to inspect the figures showing the present position of those in whom artificial pneumothorax was established (see diagram below). Of the fifty-four cases thirty are having refills as required to maintain collapse.


A.P. 54 cases
A.P. continued. 30 (55.5%)
A.P. abandoned 24 (44.5%)
Adhesions prevent good collapse. 7 (13%)
Adhesions plus fluid. 10 (18.5%)
Pyothorax. 7 (13%)

Of the remaining twenty-four, seven were abandoned because adhesions prevented satisfactory collapse of the lung ; ten had refills discontinued because of the presence of pleural effusion, together with adhesions preventing satisfactory collapse ; and in seven the development of tuberculous empyema required modification of treatment. Where artificial pneumothorax was abandoned for reasons other than the presence of pus, phrenic nerve avulsion was advised, except in one case in which apical thoracoplasty was performed. The only deaths in the series were two of the seven cases of tuberculous empyema.

Possible Aetiological Factors

TRAUMA TO THE PLEURA

This may occur in many ways, separately or together. The chief factors are: repeated puncture of the parietal pleura ; introduction of a foreign body into the pleural space ; high intrapleural pressure ; and rupture of adhesions.

(*a*) *Repeated puncture of the parietal pleura,* and probably also of the visceral pleura in the early stages of artificial pneumothorax. Burrell[1] does not consider this important, and states that thoracoscopic examination of the pleura shows that there is no inflammation around the site of punctures. However, some patients persistently experience local pain and slight fever after each refill, even in the later stages of the treatment. It seems probable that effusions which appear in the late stages of an artificial pneumothorax when the degree of collapse of the lung is fairly well stabilized are due to this cause. (In my series fluid appeared after forty weeks in six cases.)

(*b*) *Introduction of a Foreign Body into the Pleural Space.*—Considerable pleural reaction follows the prolonged presence of air in the pleural space. This is shown in two ways: (1) the thickening of pleura that gradually occurs after the artificial pneumothorax has been established a few months, detectable as increased resistance to the passage of the artificial pneumothorax needle, an effect appreciated by both the patient and the physician ; and (2) thickening of the pleura, evidenced by less mobility of the mediastinum in the later stages. Theoretically, oxygen, being more rapidly absorbed than air, should be less irritant, but it is generally agreed that the nature of the gas—air, oxygen, nitrogen, or carbon dioxide—has no effect on the frequency of occurrence of effusion. Warming the air before the introduction into the pleural space has been found a valueless refinement, whilst the rate of insertion of air, within reasonable limits, is without any influence. Filtration of the air through a modest " filter " of cotton-wool seems, on general principles, to be desirable, and is the rule in practice. It seems likely that the very small effusions which tend to occur early in any series of refills are due to this cause.

(*c*) *High Intrapleural Pressure.*—This tends to cause stretching of the pleura, particularly in the presence of adhesions. Attempts to " compress " the lung by the use of positive pressures, when the degree of collapse has been unsatisfactory, are sometimes followed by the development of effusion, even without the rupture of adhesions. Morriston Davies[4] notes the not infrequent occurrence of contralateral effusion, associated with excessive intrapleural pressure and mediastinal displacement.

(*d*) *Rupture of Adhesions.*—As previously remarked, adhesions were present in forty-six out of the fifty-four cases—85 per cent. These ranged from fine strands, seen only with difficulty, to dense bands anchoring the lung to the chest wall. Fine strands may rupture with little or no effect, probably during a fit of coughing or sneezing. Spontaneous rupture of adhesions may be associated with severe pleural shock. The effect will vary with the nature of the adhesions. Thus, when they are of the fine fibrous type, rupture may give rise to no untoward results, and be found only by *x*-ray examination. More often effusion forms, usually small, but sometimes the basis of a larger collection. The cause here is trauma. With firmer bands, having their " base " on the lung, rupture may expose a subpleural tuberculous focus, giving rise to a larger effusion. This is usually serous throughout the course, but it may become purulent. Here the state of affairs is due to trauma with added tuberculous infection. Finally, a band may include pulmonary tissue, which may contain a cavity. The effects in such a case may be slight, with effusion.

It has been pointed out that a rise of intrapleural pressure may precede the appearance of an effusion, and that the rise in pressure associated with an effusion is frequently disproportionate to the quantity of fluid. It

is suggested that rupture of the lung through a small and perhaps temporary opening, giving rise to a spontaneous pneumothorax, may be a not infrequent cause of effusion. Hutchinson and Blair[8] report several cases in which lung rupture occurred, followed by large effusion. Effects are frequently serious—spontaneous pneumothorax may become superadded on the artificial pneumothorax, with marked mediastinal displacement and great distress. Effusion rapidly develops and becomes purulent, either purely tuberculous or with pyogenic organisms as well. Broncho-pleural fistula may result. Here the cause is trauma, with added infection—tuberculous only, or with pyogenic organisms as well.

Rupture of adhesions may be intentional, as is the purpose of the Jacobaeus operation, with the use of the thoracoscope. Pleural effusion is recognized as one of the three complications of this operation, but as I have only a theoretical acquaintance with this procedure I merely mention it.

TUBERCULOUS INFECTION

Few, if any, cases of pulmonary tuberculosis run their course without some degree of pleurisy, and the subjects of artificial pneumothorax therapy can expect no exemption. It may be suggested, therefore, that the effusions are the result of tuberculous pleurisy, and this is the explanation accepted by Burrell, Morriston Davies, and others. In favour of this it is pointed out that effusions are rare in non-tuberculous cases of artificial pneumothorax, that the cytology of the fluid shows it to be an exudate, and that effusions are more likely in advanced or acute cases than in mild or chronic cases, the acuteness of the infection being more important than the amount of lung involved.[1]

On the other hand it might be noted that pleural adhesions are also less frequent in those non-tuberculous cases for which artificial pneumothorax is used—for example, non-tuberculous bronchiectasis—and that the fluid from an inflammatory process, due to trauma *plus* infection, would also have the characters of an exudate. The presence of organisms in the fluid would then depend on the occurrence of a breach of the pleural surface of the lung. That some, at least, of these effusions are infective is evident from the mode of onset. In the series here reviewed, only two cases out of the twenty-five comprising Groups 2 and 3 showed an elevation of temperature with onset of effusion, whilst in Groups 4 and 5 fever occurred in twelve of the sixteen cases (Table I). In some of these it was possible to demonstrate some disturbance at the pleural surface of the lung, as has been shown on the screen; and, in each of these sixteen, adhesions were present.

Let us turn for a moment to the group of patients who were not subjected to artificial pneumothorax over the period under consideration. This includes 541 cases of pulmonary tuberculosis. Examination of the records shows that, of these, thirty-three had pleurisy with effusion (at some time during their stay in sanatorium) *recognized as such*. Obviously, many cases of pleurisy with effusion must be overlooked in patients who are very ill and febrile, and pains of pleuritic type were commonly encountered. In this number—thirty-three—are included twenty-two cases in which pleurisy with effusion was the *only* manifestation of pulmonary tuberculosis. Thus thirty-three out of 541 cases—less than 7 per cent.—had pleural effusion, whilst the "parallel" artificial pneumothorax group had fluid in twenty-three of fifty-four cases, excluding the very small effusions—that is, 43 per cent.

It is therefore felt that there is some justification for considering that pleural effusion in artificial pneumothorax is *not* solely due to tuberculous pleurisy.

EXACERBATION OF CONTRALATERAL DISEASE

It has been stated[1] that an acute exacerbation of disease in the opposite lung will often be followed by an effusion, and that the sudden development of fluid should make one look for activity in the uncollapsed lung. If this were frequent the development of fluid would be itself an indication for reviewing the treatment. No such association was observed in this series.

CLIMATIC EFFECT

Some observers consider that effusions are more common in the cold, damp weather. The climatic variations in this region are considerable, but no definite seasonal relationship to effusion has been observed.

Calcium deficiency, the final factor, is considered in detail in the next section.

Calcium Therapy as a Preventive of Pleural Effusion

My attention was directed by Dr. J. Bell Ferguson to some work of Pisani and Smejkal on the prophylactic administration of calcium preparations in cases of artificial pneumothorax as a preventive of pleural effusion.[9] Briefly, these workers suggest that pleural effusion as met in these cases is due to the following causes: (1) Increased permeability of the capillaries, because of oxygen lack. (2) Increased osmosis. (3) Higher concentration of H ions. (4) Calcium deficiency of the pleura. (5) Aspirating effect of the endopleural negative pressure.

Any condition which causes a sudden drop in blood pressure—instances of which are "colds, over-exertion, psychic depression, and influenza"—acts as an important contributory factor. This explanation, it is emphasized, is intended for application only to non-inflammatory transudates. The suggested remedy is some preparation of calcium which inhibits (1), (2), (3), and (4) above. Using calcium gluconate, results were obtained which led the investigators to the conclusion that the treatment might be useful "as a preventive measure for pleural effusion."

The main objections to this hypothesis are: (1) There is no definite lowering of the blood calcium content in pulmonary tuberculosis. Ellman[10 11] has shown that the calcium content of the blood in this disease is within normal limits (9 to 12 mg. per 100 c.cm.), and that the administration of calcium or parathyroid extract can increase the blood calcium only within these limits. It is difficult to see, therefore, how the administration of calcium can raise the calcium content of the pleura. (2) The theory applies only to transudates. It is generally considered that the fluid in these cases has the characters of an exudate. In the cases under review no aspiration was attempted in those with only a very small effusion. In the larger effusions the nature of the fluid aspirated showed it to be an exudate. Should the smaller effusions be shown to have the features of a transudate, the line of treatment suggested would still have a very limited field of application. (3) Low blood pressure is commonly met with in sufferers from pulmonary tuberculosis.

Author's Own Series

A small series of cases was treated with calcium gluconate, as suggested by Pisani and Smejkal. In this group (the last thirteen of the fifty-four) calcium was given to every alternate patient, the intervening cases serving as controls. No selection was made. Seven served as controls and six received intramuscular injections of calcium gluconate (calcium Sandoz). The dosage was 10 c.cm. of 10 per cent. solution of calcium gluconate thrice weekly for two months, twice weekly for two months, and thence once weekly. The preparation was found to be painless and without reaction.

The results obtained are shown in full in Table IV.

TABLE IV

Case No.	Calcium Gluconate	Fluid	Adhesions
1	No	None	None
2	Yes	Needed aspiration	Present
3	No	Small quantity	Present
4	Yes	Needed aspiration	Present
5	No	None	None
6	Yes	Small quantity	Present
7	No	None	Present
8	Yes	Small quantity	Present
9	No	Small quantity	Present
10	Yes	Small quantity	None
11	No	Needed aspiration	Present
12	Yes	Small quantity	Present
13	No	Small quantity	None

These results are summarized in Table V.

TABLE V

Group	No Fluid	Small Quantity	Needing Aspiration
Controls (7)	3	3	1
Calcium gluconate (6) ...	—	4	2

While it is readily admitted that the number of cases is very small—too small to justify the drawing of any conclusions—the results do not suggest this line of therapy to be efficacious in the prevention of effusion in artificial pneumothorax.

Conclusions

The occurrence of pleural effusion in artificial pneumothorax is due to the combination of the factors of *trauma to the pleura* (using the term in its most comprehensive form), and *infection*, which may occur separately or together. It is supposed that: (1) small effusions are due to *trauma* only, and are "reactionary"; (2) larger effusions are due to *trauma plus infection*; and (3) a relatively small proportion of effusions is due to *tuberculous pleurisy*. (It might be mentioned that the question of infection from without has been purposely omitted from the discussion. Under ordinary working conditions this should never occur.)

Treatment is divisible into preventive and curative. (*a*) Preventive. (1) No medicinal treatment. (2) Careful selection of cases for artificial pneumothorax. (3) Care in refills when artificial pneumothorax is established, regular screening being regarded as essential. Positive pressures, or attempts to "compress" the lung, should be avoided. (4) Artificial pneumothorax should be abandoned if collapse is unsatisfactory before complications occur. (*b*) *Effusion present*: (1) There is no medicinal treatment of proven value. The use of calcium has again been invoked. Foix and Grunwald,[12] on the basis of three cases so treated, advocate the use of calcium chloride orally, together with a low salt diet, claiming that calcium is "essentially the medicament of inflammation in general, and of pleural inflammation in particular." On the contrary, Gordon and others[13] state that there is no evidence that any favourable effect on pulmonary tuberculosis is obtained from maintaining a high calcium content in the circulating blood. (2) If the quantity of fluid is small and not disturbing the patient, refills should be continued with careful observation, and there should be occasional aspiration of a small quantity of fluid to note possible change in character. (3) If a large effusion is present, one should aspirate and replace with air as *infrequently* as necessary. If collapse is poor, artificial pneumothorax should be abandoned in favour of other surgical measures. If the fluid does not constantly reaccumulate, and collapse is good, refills should be continued as required. (4) If the fluid is—or becomes—purulent, the treatment is surgical.

I wish to acknowledge my thanks to Dr. J. Bell Ferguson, State Director of Tuberculosis, Victoria, for permission to utilize the records from which the material here presented was derived; and to Dr. H. M. James, clinical tuberculosis officer, Central Tuberculosis Bureau, Melbourne, for kindly taking the *x*-ray photographs of the patients who had been discharged from the sanatorium, and for general assistance during the preparation of the paper.

REFERENCES

1 Burrell, L. S. T.: *Artificial Pneumothorax*, London, 1932.
2 Mattina, M.: *British Medical Journal Epitome*, February 2nd, 1935, para. 97.
3 Burrell, L. S. T.: *Recent Advances in Pulmonary Tuberculosis*, London, 1929, p. 193.
4 Davies, H. Morriston: *Pulmonary Tuberculosis*, London, 1933, p. 251.
5 James, H. M.: *Med. Journ. of Australia*, 1933, ii, 269.
6 Sachs, W.: Quoted in the *Medical Annual*, 1932, p. 549.
7 Trail, R. R.: *British Medical Journal*, 1934, i, 183.
8 Hutchinson, R. C., and Blair, L. G.: *Tubercle*, 1926, vii, 417.
9 Pisani, V. V., and Smejkal, F. J.: Ibid., February, 1934, p. 216.
10 Ellman, P.: Ibid., January, 1928, p. 162.
11 Idem: Ibid., March, 1929, p. 251.
12 Foix and Grunwald: *Presse Méd.*, January, 1934, p. 3.
13 Gordon, B., Roark, J, and Lewis, A. K.: *Journ. Amer. Med. Assoc.*, 1926, lxxxvi, 1683.

INAPPARENT VIRUS INFECTIONS

WITH SPECIAL REFERENCE TO AUSTRALIAN EXAMPLES*

BY

F. M. BURNET, M.D., PH.D.

(From the Walter and Eliza Hall Institute, Melbourne)

There has been a certain uniformity in the process by which the natural history of different infectious diseases has been elucidated. The first stage has always been the gradual disentanglement of a specific disease syndrome from other infectious processes; in most of the more important human diseases this had been fairly accurately accomplished by acute clinical observers from Sydenham onward before the opening of the bacteriological era in the 'eighties. With the development of bacteriology and the experimental investigation of infectious disease the process of sorting out the various maladies was accelerated and rendered more efficient. In particular it offered invaluable aid in the recognition of the mild case, the specific cause of which could on clinical grounds only be deduced from its association with outbreaks of the classical disease.

In very general terms we may say that by about 1914 clinical and bacteriological study had resulted in a clear demarcation of the great majority of infective human diseases. We have still some important diseases of presumptive micro-organismal origin the aetiology of which is still undetermined, but, practically speaking, there have been no important recognitions of new clinical entities among infective diseases since the war. By that time it was clearly recognized that, in addition to the frank epidemic with typical syndromes and a characteristic mortality, most infective diseases showed mild atypical cases occurring simultaneously with epidemics of the typical disease, and also that sporadic cases were more or less continually occurring in interepidemic periods.

* Read in opening a discussion in the Section of Pathology at the Annual Meeting of the British Medical Association, Melbourne, 1935.

Since the war, the most characteristic development of epidemiology has been the adoption of what may be called a more oecological point of view, in which the activities of the two organisms concerned—man and the pathogenic micro-organism—are both considered from the point of view of survival of their species. Specific disease is coming to be regarded as an exceptional incident rather than the normal result of effective contact between host species and pathogenic micro-organism. Both in bacterial and in virus diseases there has been an increasing recognition of the frequency with which extremely mild grades of infection occur, producing few or no symptoms but allowing the development of an immunity against exposure to a heavily infected environment.

These conceptions have arisen in the first place very largely from the study of diphtheria. In this disease the conditions are highly favourable for experimental investigation. The micro-organism responsible is easy to isolate and recognize, and its pathogenicity is almost wholly due to the production of a well-characterized stable toxin, whose activity can be accurately measured. Immunity to the disease is synonymous with immunity to toxin, and this can be conveniently measured either by determining the actual amount of antitoxin in the serum or by the Schick test. It has been shown clearly that the great majority of children become specifically immune to diphtheria without suffering from the clinical disease. The conception of subclinical immunization derived from these studies on diphtheria has been applied widely to other infective diseases, not least to those of virus origin.

There are two essentials if such phenomena are to be adequately studied: (1) a means of isolating and identifying the micro-organism responsible, and (2) a means of determining whether a given individual is immune or has in some other way been specifically modified by former contact with the micro-organism. In dealing with virus diseases the first requirement is often difficult or impossible to fulfil. With a few exceptions it is usually difficult to transfer a virus derived from human infection to a suitable experimental animal.

Poliomyelitis

In the case of poliomyelitis, for example, it is usually found that only about 50 per cent. of cords removed from children dying in the acute stage are capable of producing paralysis after intracerebral inoculation in the monkey. In addition it is usually necessary to make several passages from monkey to monkey before the virus is sufficiently constant in its activity to be of value for experimental work. Nothing comparable to "swabbing campaigns" in diphtheria is therefore possible, although a few isolated positive findings such as those of Paul, Salinger, and Trask (1933) have shown that the virus can occasionally be isolated from the nasopharynx of a child who does not develop paralysis. With this disease the second method is more practical—an examination of human sera for the presence of virus-inactivating substances. This is done by mixing a suitable amount of an active virus with the human serum and injecting the mixture intracerebrally in monkeys. The results indicate that approximately 80 per cent. of adults in American cities possess such inactivating substances in their blood. The interpretation of this finding is still a matter for controversy, but the consensus of opinion is to interpret it on its face value as indicating a development of antibodies following non-paralytic and probably non-symptomatic infection with the virus during childhood.

Yellow Fever

Recent work on this disease has presented a splendid example of how the whole scientific outlook on a disease may be modified by the advent of a new experimental method. The transmission of the disease to monkeys by Stokes, Bauer, and Hudson in 1928 was the first essential step, but following on this came the unexpected discovery of Theiler that by passage through the mouse brain a virus could be obtained which had purely neurotropic properties but retained all its normal immunological specificity. This discovery is the basis for two important practical applications: first, a method of safe and effective human immunization; and secondly, a practicable means of detecting the presence of antibodies in sera—that is, of discovering persons who have at some time been infected with the virus either in the form of the typical disease or in some atypical fashion. It is with this second application only that we are at present concerned.

By the middle of 1934 about 25,000 sera had been tested from all parts of the world, but particularly, of course, from countries known or suspected to be subject to yellow fever. The regions within which a proportion of the indigenous population show neutralizing antibodies in their sera are confined to the tropical areas of Central and South America and of Africa, but, particularly in the latter continent, extend far beyond the limits ordinarily thought to mark off the yellow fever areas. Throughout the West Coast region and the west and central equatorial parts of Africa the serological survey shows 20 to 50 per cent. of neutralizing sera among the natives. Typical yellow fever occurs in the West Coast, particularly among Europeans, but in French equatorial Africa and the Congo it is stated to be almost unknown. Outside these two great American and African areas, practically no sera show neutralization, and authoritative opinion is quite definite that the neutralization test is specific. It is therefore concluded that among West and Central African natives practically all yellow fever infections are mild or inapparent.

An investigation of a Brazilian district by Soper and de Andrade indicates the probable nature of the immunizing attack. Here a few typical cases occurred, but in addition about 20 per cent. of the population suffered an influenza-like infection with negligible mortality. Ninety per cent. of people giving a history of illness of this type showed neutralizing antibodies for yellow fever virus, and there can be little doubt that the attacks represented mild infections by this virus. Of the reminder of the population, with no history of such illness, 47 per cent. showed neutralizing antibodies. With these the immunizing infection was presumably completely inapparent.

Louping-ill

In the sphere of animal diseases due to viruses, one of the most interesting conditions from the present point of view is louping-ill of sheep. This is a disease which is endemic in regions in Scotland where ticks are prevalent. In its fully developed form the sheep develop a fatal encephalitis the clinical manifestations of which are mainly due to cerebellar involvement. By intracerebral inoculation of clean sheep from unaffected regions the encephalitis can be reproduced, and a fatal encephalitis can also be induced by intracerebral inoculation in the mouse. When the characteristics of the virus had been recognized, study of conditions in the field at once showed that infection with the virus was far more frequent than the appearance of typical symptoms. Sheep infected by the natural method—that is, bite from an infected tick—usually showed only a thermal reaction without symptoms of central nervous system involvement, provided that no other associated infection was transmitted by the tick. The same almost asymptomatic pyrexia followed subcutaneous or intranasal inoculation of virus. After these reactions the sheep became immune even to intracerebral inoculation of the virus.

It is still not clear what is responsible for the more severe type of infection which constitutes the typical disease. There is a good deal of evidence that when another pathogenic agent (which alone is responsible for the infection called by the Moredun investigators "tick-borne fever") is present along with louping-ill virus in the tick, the combined inoculation results in localization of the louping-ill virus in the central nervous system and in encephalitis. That this is probably not the only way in which such localization may occur is indicated by the results of an early immunization experiment.

Previous experiments had indicated that only a pyrexial reaction followed subcutaneous inoculation of active virus, but when this method was applied in a field experiment, the majority of the flock inoculated died of typical encephalitis within a week or two after inoculation. The actual process of natural subclinical immunization has probably never been demonstrated so directly as in the course of these experiments with louping-ill. Clean sheep were placed in a pasture heavily infested with tick and their temperatures taken daily. Within two months nearly all showed a typical thermal reaction without other symptoms. During the course of this pyrexia louping-ill virus was isolated from the blood in a number of instances, and subsequently the sheep which had reacted in this fashion were shown to be immune to intracerebral inoculation of the virus.

ITS POSSIBLE IDENTITY WITH *x* DISEASE

This work on louping-ill has a special interest for us in Australia on account of the possibilities (*a*) that it is present in unrecognized form among Australian sheep, and (*b*) that the louping-ill virus was responsible for the epidemics of encephalitis (Australian *X* disease) which occurred in 1917 and 1918. I have already (1934) published an account of this hypothesis, but as it has not yet been possible to prove or disprove it I shall only mention the evidence in its favour very briefly. The epidemics of *X* disease occurred in various places in the east-central region of Australia, principally in western New South Wales, but also in southern Queensland and the Goulburn Valley district of Victoria. It was limited to the late summer months of each year in which it occurred. Clinically it was an acute encephalitis with a mortality among the reported cases of about 80 per cent., affecting all ages but principally children.

The evidence that this disease was due to infection by louping-ill virus is at present purely circumstantial, but follows two distinct lines of reasoning. In the first place we have the epidemiological evidence which indicates that the infection was almost certainly derived from some widespread animal reservoir rather than by case-to-case or carrier infection. The salient point in this respect is that in each of the epidemic years cases occurred almost simultaneously in several regions between which there was practically no possibilty of human communication, except via Sydney, where no cases occurred. The most likely animal common to this area which might serve as a reservoir is the sheep, though others would also have to be considered. The second line of evidence concerns the properties of the virus isolated by Cleland and Campbell from the brains of patients dying of the disease. This virus was transmissible to monkeys, a considerable proportion of sheep, and to one calf. It was not pathogenic for guinea-pigs or rabbits. The disease produced in monkeys was distinct from the purely paralytic manifestations of poliomyelitis, and in the first stages the symptoms indicated an incoordination of muscular activity rather than paralysis. In all these respects the virus resembled the known activities of louping-ill virus. According to a private communication, Perdrau at the National Institute for Medical Research has re-examined histological material from Cleland and Campbell's cases and experimental animals, and finds—particularly in the sheep and monkeys—experimentally inoculated lesions which are compatible with the hypothesis that they were due to louping-ill virus.

It is not easy to diagnose a disease seventeen or eighteen years after it has occurred, nor is it easy to trace the two or three dozen survivors of those reported to have had the disease, and, up to the present, only one serum has been tested for its inactivating effect on louping-ill virus. It was completely inactive. This, of course, means either that the infection was not louping-ill or that any antibody produced by the infection had disappeared in seventeen years. Further attempts are under way to obtain serum from survivors and to look for possible mild infections of this type among sheep.

The justification for discussing this problem in the present connexion lies in the epidemiology of the disease. Whatever the nature of the virus it did not reach the affected patients from men or animals suffering from the disease. Cleland made a careful search for possible associated animal diseases, and could only conclude that if an animal reservoir was involved the virus must be incapable of producing symptoms in its natural host. The alternative explanation of widespread human carriers equally demands that the great majority of infections were completely inapparent.

Psittacosis

Psittacosis in human beings has generally been regarded as resulting from association with *sick* parrots. This was almost always the rule in the extensive outbreaks in 1929–30, but it does not appear to be necessarily always the case. A number of instances have been reported, particularly from Germany and Switzerland, in which apparently healthy birds subsequently shown to be virus carriers were incriminated.

Recent work in California and in Germany has indicated that at the present time the Australian budgerigar *Melopsittacus undulatus* is responsible for far more cases of psittacosis than all the other cage birds together. Both in Europe and in America the vast majority of budgerigars are bred in local aviaries, and there is no indication that the infections occurring among them are of extrinsic origin. Meyer and Eddie (1934, *a*) have recently carried out a very extensive and valuable survey of the conditions in Californian budgerigar aviaries. They found a surprisingly high incidence of infection, more than half (54 out of 104) the aviaries examined containing some infected birds. Sometimes the virus made its presence obvious by the occurrence of fatal epizootics among the stock, but more often there was only an occasional death with a high percentage of apparently healthy birds showing enlarged virus-containing spleens. They found in infected aviaries the normal course of events was for the nestlings to become infected in most cases without obvious symptoms, and to manifest an enlarged infective spleen for the first six or eight months of life. After this period it is more frequent to find an enlarged but non-infective spleen, and it is adopted as a working rule in the control of the disease that a budgerigar over one year can be safely regarded as non-infective for human beings.

These conditions seem to represent a more or less stabilized equilibrium between virus and parakeet, which has probably been developing over many generations, and might even be characteristic of the species in the wild state. Meyer and Eddie (1934, *b*) in fact found that among a cargo of 200 budgerigars specially caught in South Australia a small number developed sickness, and were proved to contain a weakly active virus in their tissues. It was therefore of considerable interest to in-

vestigate the common Australian parrots in regard to the prevalence of psittacosis among them, particularly in the wild state.

During the summer of 1934–5 I undertook a preliminary survey of the common Australian parrots from this point of view, and found immediately that psittacosis was extremely common among certain species, both in specimens purchased from dealers and in birds freshly caught in the bush and examined without passing through any dealer's premises.

Incidence of Psittacosis Infection amongst Australian Parrots

Genus	Origin	Proved Psittacosis	Enlarged Non-infective Spleen	Normal	Total
Psephotus ...	D	11	0	12	23
	W	17	0	28	45
Platycercus ...	D	5	8	20	33
	W	0	9	51	60
Leptolophus ...	D	4	0	0	4
	W	2	0	4	6
Melopsittacus ...	D	1	1	4	6
	W	0	0	15	15
Trichoglossus ...	W	7	0	3	12
Kakatoë	D*	2	0	1	3
	W	1	10	34	45
Neophema ...	W	0	0	3	3
Barnardius ...	W	0	1	4	5
Total		50	31	179	260

D = Obtained from dealers. D* = Three cockatoos received dead from unrelated houses in Melbourne. W = Caught in wild state within a few days of examination.

The table shows the results of examining 260 birds from eight genera. The birds from dealers are separated from those freshly caught, but it seems rather likely that most of the infections found in the former group were actually contracted in the wild. It may be noted that none of the dealers' birds was bred in captivity. From the table it appears that the three genera *Psephotus* (the common green grass parrots) *Trichoglossus* (lorikeets) and *Leptolophus* (cockatiels) are very prone to be actively infected when caught. Infection appears to be much less widespread among the rosellas (*Platycercus*), cockatoos (*Kakatoë*), and budgerigars (*Melopsittacus*), but in the first two of these groups a rather large proportion of enlarged non-infective spleens is found. These spleens can with a high degree of probability be ascribed to past infection with psittacosis. We can conclude that all of the common Australian parrots and cockatoos are susceptible to psittacosis, and that in a number of species the infection is widespread in a state of nature. Although there has been no opportunity to study the course of the natural infection in the wild with the same detail there seems to be every likelihood that conditions are almost entirely similar to those obtaining in Californian budgerigar aviaries.

The origin of the Australian infections can hardly be traced to extrinsic sources: the range of species involved and the wide geographical distribution of infected birds is much more indicative of a long-established enzootic distribution of the virus. So far as I know this survey represents the first published work on wild parrots examined within a few days of capture, so that we do not know whether similar conditions exist in the wild parrots of other countries, notably South America. From Meyer and Eddie's (1934, *c*) observations on cargoes of South American parrots reaching California it seems likely that some of these species are also enzootically infected in the wild, but the possibility of infection from extrinsic sources during transit could not be excluded. Until this point is cleared up it remains a possibility that psittacosis is a specifically Australian disease, but it seems more probable that it is a more or less universal disease of parrots, perpetuated almost wholly by way of latent infections, but always liable to show increase of virulence for its natural host and for such accidental hosts as man.

Commentary

It is becoming increasingly clear that all epidemiological problems can be most profitably studied along oecological lines, as an interaction between two or more species of living organisms. At the basis of all oecological arguments we have the conception that all living organisms are to be regarded as "endeavouring" to convert as much as possible of the available foodstuff in their environment into living organisms of their own kind. This is perhaps the simplest definition of a living organism. Every organism finds a multitude of limiting conditions which curtail such expansion, and, in fact, the measure of success on the part of a species is simply ability to survive. Oecologically important environmental agencies—for example, meteorological conditions—are frequently highly variable, and we must qualify "survival" to "survival in sufficient numbers to ensure a margin of safety against extinction by any reasonably likely combination of adverse circumstances."

Such considerations hold as much for pathogenic bacteria and viruses as for sheep and parrots or mice and men. The virus of an existent disease has, in fact, demonstrated its ability to survive, and all the evidence points to the probability that in most cases survival of a virus is by passage through hosts not seriously affected by such passage. A fatal infection may allow a tremendous temporary multiplication of virus, but in most cases it is a futile proliferation allowing no further transmission of the virus and hence is of no survival value.

Psittacosis as observed in Australian (or Californian) parrots may well be regarded from the point of view of the virus as the ideal compromise. The virus is of high infectivity but of low virulence: a large proportion of parrots, perhaps all, are infected; some die, some eliminate the virus completely, but a majority harbour it in their spleens and presumably liberate infective material into their environment, most likely via the faeces. In several of the other conditions which have been mentioned—louping-ill in sheep, yellow fever in West African negroes, or poliomyelitis among American children—the same nearly balanced equilibrium has been established. Under conditions where the attainment of an equilibrium is not prevented, either by sudden or large changes in the distribution of density of the susceptible population or by human action directed toward preventing spread of the virus, these widespread low-grade forms of infection will usually become established. The symptomless or almost symptomless infection of the natural host can be regarded then as the equilibrium condition best suited to the survival of both species (pathogenic virus and host vertebrate) concerned.

But it is characteristic of interactions between species that the apparent equilibrium is very far from static. In most cases there are wide fluctuations, now in favour of one organism, now of the other. An excess of small rodents one year will provide the means for an unusual increase in the carnivore population, and in the following year the excess of carnivores may reduce the rodent numbers to well below the mean, and so on. In our present problem the fluctuations are expressed as variations in the virulence intrinsic or relative of the virus.

The essential nature of an increase in the virulence of a pathogenic micro-organism is as uncertain as that of any other heritable modification of a living organism. Some alteration in its specific structure has taken place, which perhaps in the case of a virus fits it better for entering the susceptible cells of the host. In any case there is no question that in nature different strains of the same virus possess different virulences. Any strain which develops an increased virulence will naturally flourish for a time at the expense of the host species, and the existence of the virus will now be manifested by the occurrence of numbers of typical symptomatic infections. The virulent strain, however, will probably soon be eliminated by the progressive reduction in the number of susceptible hosts either by death or by immunization of survivors. Other factors also may be concerned, and it is possible that the apparent changes in virulence are to some extent at least really changes in the resistance of the host species. Whatever the reason, experience indicates that all epidemics eventually lose their intensity and the virus survives through the long interepidemic periods in a less active form more adapted to establish an equilibrium condition with the host species.

There is another aspect of virus diseases which bears on this question of whether infection is symptomatic or inapparent. This is the effect of the age of the host on the intensity of the disease produced by infection. Most of the available data on this point are naturally derived from human infections, but there are hints that similar effects are visible in animals and birds. In general the younger the individual the more likely a given infection is to take an inapparent form. This refers of course only to first infections with the virus in question. Subsequent infections will be modified or prevented by the immunity induced in the earlier attack.

This phenomenon is responsible for the characteristic difference between the age incidence of a disease due to a ubiquitous virus and that of diseases due to "new" viruses which have not previously appeared in the community. In the first group we have as a typical instance poliomyelitis among an urban population, with its sharp peak in the first five years of life. This peak, however, represents a very small proportion of the children, who must equally be infected by the virus in inapparent form, and in consequence of this infection develop the basic immunity that protects them from typical infection throughout life. The real susceptibility of different ages in the absence of immunity is indicated by such an outbreak as that in New Guinea in 1929. In this epidemic a very high proportion of the adult population showed severe paralysis, but children were only rarely affected clinically. It is well known that, even in civilized urban communities, cases among adults when they occur are on the whole more severe than those recognized in children during the same epidemics.

The epidemic of encephalitis in St. Louis, United States of America, in August, 1933, provided a striking example of a new virus disease apparently of no great intrinsic virulence, affecting a completely non-immune community. In this epidemic children were practically unaffected, and cases were rare and deaths still rarer in persons under 40 years of age. It was in the higher age groups, particularly over 60, that the great majority of deaths occurred. Since it is highly improbable that older people were more likely to come into contact with infective material than younger ones, the only available explanation for this age incidence is that in the younger individuals only inapparent infections occurred.

Another "new" disease is human psittacosis, and here, too, all statistics show that children are very rarely affected, even when they live under the same conditions as adults who are fatally infected. Typhus fever is far from a new disease, but, owing to the conditions of its spread when an outbreak occurs in times of social disaster, most of the population affected have not had an opportunity to become immunized, and again we find the characteristic intensity of attack on adults, with much milder symptoms in children.

Conclusion

This general distinction between endemic diseases, such as poliomyelitis, and the other common infectious diseases and the new diseases brings us back again to the oecological point of view. The relative non-susceptibility of the young is a clear adaptation to allow survival in the presence of pathogenic micro-organisms until specific adult immunity can be developed, and the whole process is admirably suited to allow at least sufficient human survival in an environment where disease germs are transmitted by all conceivable routes as readily as they are now from nasopharynx to nasopharynx. Up to the last century the vast majority of human beings have lived under conditions in which this free transfer of infective agents could occur. From the time when the first human communities developed down to the beginning of the bacteriological era, there has been an uneasy equilibrium between the human species and the various pathogenic micro-organisms. On the one hand, there have been the appearance of micro-organismal strains of higher virulence with associated epidemics and human deaths; on the other, there has been the development, under the stress of a very direct form of natural selection, of the double mechanism for resisting infection—first, innate resistance in the young leading to inapparent immunizing infections, and secondly, the gradual replacement of this innate resistance by a specific immunity as the individual ages.

On the whole the equilibrium persisted, the human species increased in numbers fairly steadily throughout history, but at the same time most of the agents of its diseases also flourished. Within the last fifty years a serious attempt has been made to disturb this oecological equilibrium to man's advantage. On the whole it has been very considerably successful, but all such disturbances of long-established natural conditions are liable to have unexpected consequences, and it will probably be found that the safest way to progress with most infections is to imitate as far as possible the natural source of protection—the inapparent infection.

Bibliography

Burnet, F. M.: *Med. Journ. of Australia*, 1934, i, 679.

Cleland, J. B., and Campbell, A. W.: *Journ. of Hygiene*, 1919, xviii, 272; Eighth Report of Microbiological Laboratory of New South Wales for 1917, Sydney.

Meyer, K. F., and Eddie, B.: (*a*) *Klin. Woch.*, 1934, xiii, 865; (*b*) *Proc. Soc. Exper. Biol. and Med.*, 1934, xxxi, 917; (*c*) *Science* (New York), 1934, lxxix, 546.

Paul, J. R., Salinger, R., and Trask, J. P.: *Journ. Amer. Med. Assoc.*, 1932, xcviii, 2262.

Soper, F. L., and de Andrade, A.: *Amer. Journ. Hygiene*, 1933, xviii, 588.

Stokes, A., Bauer, J. H., and Hudson, N. P.: *Journ. Amer. Med. Assoc.*, 1928, xc, 253.

Theiler, M.: *Ann. Trop. Med. and Parasitol.*, 1930, xxiv, 249.

According to a recent investigation by F. L. Hoffman, cancer in its various forms is much rarer in the Far East than in America or in Europe and is probably about half as common in the large towns as in American and European larger towns. Cancer of the breast in native women and cancer of the penis in native men is very uncommon, especially among the Chinese. On the other hand cancer of the buccal cavity is remarkably frequent among men and women in the Malay States and the Philippines, and is attributed to chewing of betel nut.

HEART DISEASE COMPLICATING PREGNANCY*

BY

H. C. E. DONOVAN, M.B., F.R.A.C.S., F.C.O.G.

SENIOR HONORARY SURGEON, THE WOMEN'S HOSPITAL, SYDNEY; LECTURER IN CLINICAL OBSTETRICS, UNIVERSITY OF SYDNEY

This paper is based on a general impression of cases seen in hospital and consulting practice, and on an analysis of fifty-two cases which were treated in the ante-natal wards of the Women's Hospital, Sydney, their symptoms having been sufficiently grave to necessitate admittance. During the period under review there were 20,306 deliveries, and the percentage of heart cases requiring indoor treatment was thus 0.255. This percentage is lower than many published, but does not include cases of organic heart disease with no or mild symptoms.

There were two maternal deaths in the series. One was due to pulmonary embolism following Caesarean section. The other was a case of advanced myocardial degeneration in a thirteenth pregnancy; the patient died from syncope on the day following an easy short labour. Seventeen patients had Caesarean section; three had labour induced; four had therapeutic abortion by the vaginal route or abdominal hysterotomy. Labour was natural in the remainder, but in most cases the second stage was shortened by forceps. In the private cases the methods of treatment were similar.

The most common form of heart lesion encountered has been mitral stenosis. Other types are myocardial degeneration in elderly multiparae, three cases of congenital heart disease, aortic stenosis, and aortic regurgitation. One patient with the last-named condition, who was seen before compilation of this series, was anaesthetized in an almost upright position for Caesarean section. Two and a half years later, when touch was lost with her, she was walking about in comfort.

Factors Deciding Treatment

When deciding the treatment of a case of heart disease complicating pregnancy many factors must be considered. Among these are the character of the lesion, the stage of pregnancy, the previous cardiac and obstetric history, the age and parity, and the clinical findings and symptoms. The importance of a full and carefully taken history cannot be overestimated. The social and economic position of the patient must be considered. It is obvious that a woman who can afford adequate rest and care can receive treatment that would be impossible in the case of a household drudge with a houseful of young children. This problem cannot be met by enlarged ante-natal accommodation, for provision must be made for the husband and children during the enforced rest of the mother.

Many of the above factors are difficult to assess. Even with complete knowledge of the functional capacity of the heart we still have to estimate the strain that will be imposed on it by labour. We can estimate this to some extent by the previous obstetric history (with special regard to the weights of the infants, and the length and difficulties of the labours), by the pelvic measurements, the apparent size of the foetus, and its presentation and position. But every labour must be an experiment to the extent that such factors as the expulsive powers and the capacity of the head to mould are unpredictable. A woman with efficient heart muscle can, and does, make this experiment with safety in most cases, but a mistake in our estimates, no matter how carefully all these factors have been weighed, can kill or cripple for life a heart that is much below normal functionally.

In selecting the method to be adopted in any particular case due weight must be given to all these factors. Treatment should not be limited to preservation of the maternal life, and, if possible, of a live and viable child, but be directed to the securing that the woman shall be as active and as useful a citizen as before pregnancy. Too often one sees a woman with, in particular, mitral stenosis symptoms pass apparently successfully through the stresses of labour only to die a short time later from myocardial failure or to become a chronic invalid incapable of the proper care of her child.

Indications for Terminating Labour

When one has to deal with a pregnant woman with definite symptoms caused by a diseased heart the first question is whether pregnancy should be allowed to continue, and, if so, whether she will be able to undergo normal delivery. Therapeutic abortion may be necessitated by breathlessness, oedema, haemoptysis, hepatic congestion, crepitations at the bases of the lungs, and so forth, but only when these persist in spite of rest and treatment. When gestation has lasted less than three to three and a half months the uterus is better emptied in one stage. After this length of time such a procedure is difficult and dangerous. Induction by bougies, tube, or gauze is slow, the manipulations frequently extending over some days. This delay, with the accompanying anxiety, is bad for a woman whose condition is grave enough to justify therapeutic abortion. Abdominal hysterotomy is cleaner and safer, and gives an opportunity for sterilization without added risk.

I consider that cases needing or justifying therapeutic abortion are rare. Most patients can continue until the child is viable, and many can stand natural labour. If a woman can perform her domestic duties without undue fatigue or marked breathlessness she can, as a rule, stand the strain of labour, especially if she is a multipara. If, on the other hand, ordinary domestic duties cause distress and are performed with difficulty, her immediate risk will be minimized and her future health be best safeguarded by a timely Caesarean section. When oedema and tachycardia persist, in spite of confinement to bed and the exhibition of digitalis, Caesarean section is the obvious solution.

Patients who are free from serious subjective symptoms when they come under observation, but give a history of failure of compensation or of auricular fibrillation at a previous pregnancy or at any time, present a more difficult problem. I am convinced that the immediate and remote prognosis in these cases is improved by Caesarean section shortly before calculated term, since while the actual stresses of labour contain emergencies which are largely incapable of accurate prediction, the operative and anaesthetic risks attached to Caesarean section are fairly constant. In the decision for or against this procedure the response to effort tests is of only limited prognostic value, because of the nervous element involved. The pulse rate while the patient is out of bed for a few days and walking round the ward is a much more useful criterion.

The series examined contained three cases of induction of labour. These were treated by colleagues; I never induce labour mechanically for heart disease. A mechanically induced labour is frequently complicated by inertia, and the disturbance of the comfort of the patient continues in many cases for several days. The effects of anxiety and the risks of sepsis more than counterbalance

* Read on behalf of the author by Professor J. C. Windeyer in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Melbourne, 1935.

the risks of lower segment section. I believe that when the history and results of examination leave a real doubt as to the safety of natural labour after a conscientious consideration of all the facts, the balance should swing to Caesarean section. A mistake is irretrievable. Trial labour, which saves us from so many errors of treatment in dealing with disproportion, has no place in the treatment of heart cases. In spite of many statements to the contrary, the lower uterine transverse operation is quite safe and comparatively easy in operations of election before the commencement of labour, and it should be chosen because of its lower mortality rate.

Special Forms of Heart Disease

In aortic disease I consider that pregnancy should not be permitted generally. If it occurs, and the case is seen early in pregnancy, the uterus should be emptied. If seen later, an attempt should be made to continue pregnancy, and to perform Caesarean section when the child has become viable. Congenital heart lesions imply bad obstetric risks. Therapeutic abortion or Caesarean section should be performed according to the severity of the symptoms. I recollect three of these cases when extreme cyanosis was present. Two patients survived Caesarean section, and were no worse than before pregnancy, but the third died ten days after the operation with gradually developing cardiac failure. On account of the pulmonary engorgement gas and oxygen anaesthesia is preferable to ether.

Patients with mild thyrotoxic states will stand labour, but should be prepared by adequate rest. Their emotional reactions should be controlled during labour by adequate calming, preferably by the administration of a barbiturate preparation. I have performed Caesarean section in three cases of advanced disease. In all of these the pulse rate rose by thirty or forty in the first hour or two. Two of these patients have since had partial thyroidectomy.

Acute pulmonary oedema is a serious complication of pregnancy. Venesection, oxygen, and morphine are indicated; at least a pint of blood should be withdrawn. Not included in the series are two cases of lobar pneumonia, treated thus by colleagues at my suggestion. One patient recovered and the other died from intestinal obstruction. The mortality from heart failure is so constant in this terrible complication of late pregnancy that this treatment appears to offer the only chance of recovery. It should be undertaken early.

Conclusion

1. Most heart cases are capable of passing successfully through pregnancy; it is the labour which tests the heart's efficiency.

2. Therapeutic abortion is indicated principally in cases of cardiac reinfection during pregnancy, the few cases which are getting worse in spite of bed and digitalis treatment, and the more severe forms of aortic disease and congenital malformation.

3. In deciding for or against Caesarean section the general and obstetric history and the capacity for household work are the main points on which the decision turns.

4. A surgically induced labour may be, and usually is, more trying than normal labour. The risks are less easily calculated than are those of Caesarean section, and it is rarely good treatment after three months' gestation.

5. The purely operative risks of Caesarean section have been so much reduced by the lower uterine segment operation and the newer antiseptics, especially dettol, that one operates nowadays with far more confidence.

EPIDEMIC STREPTOCOCCAL ADENITIS

BY

REGINALD MILLER, M.D., F.R.C.P.

PHYSICIAN TO THE PADDINGTON GREEN CHILDREN'S HOSPITAL, AND TO ST. MARY'S HOSPITAL, LONDON

During the influenza seasons of the last two winters there have appeared to be running, chiefly among children, epidemics of acute cervical adenitis accompanied by rigors and high fever. Although the illness induced is unusual in type and alarming in severity, H. C. Cameron[1] is, so far as I am aware, the only medical author who has recently called attention to this group of cases, and this brief article may be of help if the epidemic recurs in the next three months.

The peculiarity of these epidemic cases lies chiefly in the frequency with which rigors and up-rushes of the temperature occur. The illness as a whole simulates those severe reactions with adenitis that may follow an operation for the removal of septic tonsils; but it must be admitted that in certain influenza epidemics there may occur, chiefly in adults, cases of rigors and very high temperature without conspicuous adenitis.

Aetiological Factors

Of the cases seen, amounting to some twelve in all, all were in children except two—one a girl in her teens and the other a young adult, an undernourished film actor. The last-mentioned was the only case in which the glands suppurated. Only two of the series were seen in hospital practice, a peculiar point, presumably accidental, which has prevented thorough examination of many of the cases.

[1] Cameron, H. C.: *Clin. Journ.*, January, 1935.

Setting aside the possibility of an infection by a filterable micro-organism, the disease has the clinical appearance of an infection by a haemolytic streptococcus, as Cameron has stated. I have only been able to confirm this in the two hospital cases: a boy whose throat contained haemolytic streptococci and whose blood culture was negative; and the young adult whose glands suppurated, when a pure growth of the same micro-organism was obtained from the pus from the glands.

There is a close association between epidemic adenitis of this type and influenza. The cases seen occurred during the influenza seasons of two consecutive winters, and in some instances occurred in association with other forms of influenza in the same family. In the following instance the parents, suffering from different types of influenza, appear to have infected one child with the adenitis type, which was later transmitted from the first to the second child.

A father of two children became suddenly ill with vomiting diagnosed as "gastric influenza." After a few days this ceased and he developed a severe coryza, with sore throat and characteristic tracheitis. As these symptoms subsided his wife developed a sore throat, headache, and pains in the limbs; she, however, kept about, "living on aspirin." When the father was better he motored his wife and two children to the South Coast for convalescence. One child arrived having a rigor, with a temperature of 105° and incipient cervical adenitis. Forty-eight hours later the second child developed the same symptoms as the first.

Invasion

As a rule the first marked symptom is the sudden development of high fever, with or without a rigor, and very rapidly there develops pain in the neck from the inflammation and swelling of the tonsillar and other

lymphatic glands. These rather dramatic symptoms may be preceded by one or two days during which the child may have a slight sore throat and stuffiness at the back of the nose, as though about to develop a severe cold in the head. The local symptoms, however, remain comparatively slight.

In one instance the adenitis was not the earliest condition, but developed in the third week of an infection of influenzal type.

A boy aged 12 was taken ill at a preparatory boarding-school with vomiting lasting for three nights and two days, and accompanied by high fever without rigors. No other boy was affected. After six days, the fever having almost abated, as term had ended, he was transferred to a nursing home in London under my care. He was found to have broncho-pneumonia at the right base, with a small effusion (confirmed by radiograph). At the end of a week, as the temperature was settling and the lung clearing, he developed an enlarged, painful submaxillary gland on one side, where a lower tooth was being cut. His temperature was again raised, his spleen became palpable, and his blood showed a white cell count of 11,500, with 70.5 per cent. polymorphonuclear cells. Further glands were rapidly involved on both sides, and about three months passed before they completely disappeared.

Course

Starting in the tonsillar lymphatic glands or in those under the sterno-mastoid muscles, the adenitis rapidly spreads, and usually both sides of the neck are involved. At first the swollen glands are painful and tender, and throughout they are very hard to the touch. In only one case did they suppurate, but they take many weeks to disappear completely. With the glandular enlargement there is a moderate leucocytosis showing a relative increase in the polymorphonuclear cells.

The most curious feature of the complaint is the frequency with which rigors occur. These were seen in more than half the cases in the series, and in many instances were repeated four or five times during the illness. In one case a rigor occurred at about 3 p.m. every day for five days, and in another a rigor occurred in the fifth week of illness after the child had been seemingly better for a fortnight. With or without rigors there is a tendency for the temperature to undergo large swinging movements. When at its lowest the child, although uncomfortable, does not appear too ill; but as the temperature runs up to 103°–105° the child is very much prostrated, with a rapid pulse and a general condition which causes a feeling of anxiety. The worst of the illness is over in five to ten days, but the complete disappearance of the fever is a matter of three or four weeks.

Diagnosis: Prognosis: Treatment

In a typical case the infection is far too fierce in type to be mistaken for anything other than a streptococcal adenitis. Milder cases would lack the mononucleosis of glandular fever.

As I have seen it this disease is more alarming than dangerous. In spite of high fever, rigors, and considerable prostration, all the cases in my series have recovered satisfactorily. As complications I have met broncho-pneumonia, otitis, and albuminuria; and Cameron has recorded nephritis.

In treatment an attempt should be made to disinfect the nose and throat by means of nasal oil, sprays, or gargles, and potassium chlorate, with sodium salicylate and sodium bicarbonate, should be given internally. Sponging will be needed for the fever. The glands in the neck are usually sufficiently painful to produce a satisfactory degree of immobilization of the affected parts. It is tempting to make use of subcutaneous injections of anti-streptococcal serum (scarlatinal), but I have not myself seen it do any real good.

Discussion

It is difficult to understand why these cases of adenitis should have made their appearance in the last two influenza seasons, but it is rather characteristic of influenza that its epidemics should show these curious variations. Pneumonia, otitis, tracheitis, jaundice, and myocarditis may be mentioned as manifestations of influenza which may show a peculiar prevalence in any particular epidemic. It is, further, difficult to appreciate in what way these cases of adenitis differ from the "haemolytic streptococcal throats" which so commonly give rise to epidemics in children's medical wards. To assume that the virulence of the haemolytic streptococcus is much exalted in the adenitis cases hardly disposes of all the difficulty.

But the most interesting point arises in connexion with the rigors seen in these cases of epidemic adenitis. In their frequency and severity the rigors are unlike anything seen in other infections in children. As has already been stated, these epidemic cases resemble most closely the rather alarming reactions that may occur immediately after the removal of septic tonsils; but in such surgical cases it is generally held that the quick swelling of the glands is of good omen, setting up a barrier to a possible fulminating infection of the blood stream. It is therefore a very interesting point that in the epidemic cases, in spite of the adenitis, rigors may occur for several days and yet no ultimate harm arise from the repeated infections of the blood stream which the rigors presumably indicate.

CORNEAL GRAFTING (KERATOPLASTY)

SOME MODIFICATIONS IN TECHNIQUE

BY

H. B. STALLARD, M.A., M.D., F.R.C.S.

ASSISTANT SURGEON, ROYAL LONDON OPHTHALMIC HOSPITAL (MOORFIELDS); CHIEF ASSISTANT, OPHTHALMIC DEPARTMENT, ST. BARTHOLOMEW'S HOSPITAL

The purpose of this short paper is to describe certain modifications in the technique of corneal grafting which I have found helpful and of some value in working on post-mortem and living material.

An essential part of cutting a corneal graft is bevelling the deeper part of its substantia propria and that of its bed so that the graft will not slip from its bed into the anterior chamber. Elschnig and others have used von Hippel's mechanical trephine, an instrument difficult to control and liable to inflict severe damage. Tudor Thomas cuts the shelf in the deeper layers of the cornea with fine curved scissors. Castroviejo prepares a rectangular graft by incising half the thickness of the cornea with portions of razor blades set parallel 4 mm. apart in a clamp. A specially constructed bent keratome with a spear head but blunt sides is then passed obliquely into the anterior chamber at the upper extremities of the incisions and counter-punctures at the lower extremities. A blunt-ended thin spatula with one edge sharp is then passed into the anterior chamber between the two keratome incisions and manœuvred to cut obliquely through the deeper half of the cornea on each side to join the original incisions made by the razor blades, thereby fashioning a shelf, sloping from within outwards. Von Hippel's mechanical trephine does not make a corneal shelf, Castroviejo's manipulations are made very difficult in the case of a recipient whose cornea is so far opaque that the position of instruments passed into the anterior chamber cannot be judged visually, and Tudor Thomas's work with scissors, in spite of skilful execution, causes some crushing and mutilation of corneal tissue.

It seemed to me that a series of cuts less than 1 mm. long set side by side at a slight angle, and made by sweeping a small angular knife obliquely through the deeper half of the cornea around the circumference of the graft and its bed would cause less damage than other methods practised to date. Fig. 1 is a diagram of this knife and illustrates its simple features. The method of using it is described in the account of the operation given below. With improved methods it is probable that some better means will be devised to effect this difficult part of the operation with greater precision and the minimum of trauma.

Sutures of various kinds have been employed to retain the graft in its proper place. A mattress suture passing between the limbus at 12 o'clock and 6 o'clock, 9 o'clock and 3 o'clock, is liable to catch under the edge of the graft during convalescence and so to lift it out of place. Tudor Thomas has an ingenious method of cross-stitching, the sutures passing through opaque cornea adjacent to the site of the graft but none perforating it. Castroviejo draws conjunctival flaps together over the graft by undermining conjunctiva from the limbus backwards above and below, and leaving two strips about 3 mm. wide uncut at 9 and 3 o'clock respectively. Rycroft has employed a complete conjunctival flap drawn over the entire cornea and its graft and retained in place with a purse-string suture. This latter method I have used and found satisfactory for keeping the graft in position and protecting it for six days, during which time it is "taking." It is also possible that during this period the graft derives some nutrition from the serum and lymph from the under surface of the conjunctival flap. My colleague Mr. L. B. Somerville Large has suggested the alternative of drawing

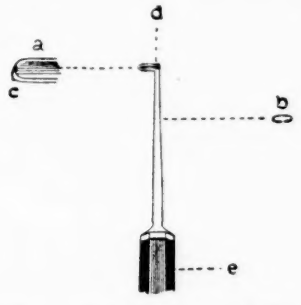


FIG. 1.—Diagram of corneal knife. a, Magnified view of the knife blade. The cutting edge is 1.5 mm. long, and is continued half-way round the curved extremity of the knife, shown in the diagram by the bracket c. b is the shaft, which in section is a flat oval. d is rounded and smooth. e, Bakelite handle.

a large conjunctival flap from above downwards over the graft and securing it in position with two mattress sutures (Fig. 2).

On account of the roving movements which occur during operations on an eye with a densely opaque cornea I felt that some stability and security could be afforded by passing two No. 1 white silk sutures through the superficial layers of the sclera about 1.5 mm. from the limbus at 12 o'clock and 6 o'clock respectively. These sutures may be held by the assistant with the degree of tension necessary to steady the globe and to maintain it in the desired position during operation.

Pre-operative Preparation

Cultures are taken from the conjunctival sac of the donor and recipient, and operation is contraindicated if any pathogenic micro-organisms are grown during forty-eight hours' incubation. Drops of eserine 1 per cent. aqueous solution are instilled into the recipient's eye the night before and on the morning of operation.

Irrigations with lotio hydrarg. oxycyanid. 1 in 8,000 are carried out thrice daily for three or four days before operation and a salve of hydrarg. oxycyanid. 1 in 5,000 may be used at night time. On the day of the operation sterile normal saline is used for cleansing the conjunctival sac, the lashes are cut, and the skin of the eyelids and face prepared in the customary manner.

Operation

The recipient's eye is anaesthetized with two to four drops of pantocain, 1 per cent., a derivative of novocain which has no deleterious effect upon the corneal epithelium, and does not dilate the pupil or raise the intraocular pressure. Its only defect in comparison with cocaine is that capillary oozing is not so effectively checked, but this may be overcome by instilling a few drops of adrenaline.

A facial nerve block with 2 c.cm. of 2 per cent. novocain injected at the site where the upper branches of the seventh cranial nerve cross the neck of the condyle of the mandible, and 1 c.cm. of 2 per cent. novocain injected into Tenon's capsule are of value in securing akinesia of the orbicularis oculi and anaesthesia of the anterior segment of the eye.

No. 1 black silk sutures are passed through the skin of the upper and lower lids for 4 mm. at points 2 mm. behind the lash margin, and are used for the purpose of lid retraction by clamping the ends of the sutures with Spencer Wells forceps to the sterile towels over the head and lower part of the face respectively. (See Fig. 2, a a, a a.)

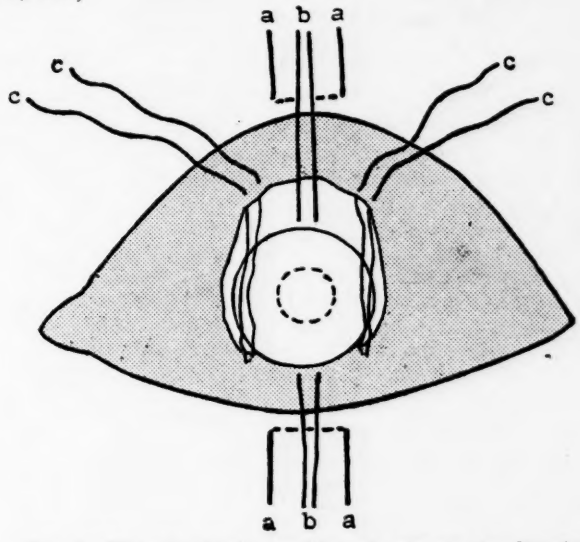


FIG. 2.—Diagram showing position of sutures. a a, Traction sutures through the lid margin. b b, Fixation sutures through the sclera near the limbus. c c, Mattress sutures to hold the conjunctival flap in position over the upper seven-eighths of the cornea after the graft is in place.

A lid speculum is used during the preparation of a conjunctival flap, but is removed when the bed for the corneal graft is being prepared, lid retraction being effected by the sutures in the lids.

With Hudson's knife the conjunctiva is incised around the entire limbus and with scissors undermined sufficiently so that it may be drawn over the cornea as a complete covering. A purse-string suture of No. 1 black silk is passed 1.5 mm. from the cut edge of the conjunctiva, and at the end of the operation, when this suture is drawn in and tied, the conjunctival flap should exert an even and uniform pressure over the cornea and its graft.

When the conjunctival flap is fashioned above mattress sutures are placed through the episcleral tissues and conjunctiva at the limbus at 5 o'clock and 7 o'clock respectively (Fig. 2) to retain it in position as a covering over the upper seven-eighths of the cornea.

If desirable at this stage the episcleral tissues at the limbus may be scraped in a band 3 mm. wide to eradicate granulation tissue and to divide newly formed vessels entering the cornea (peritomy).

Sutures of No. 1 black silk are passed through the superficial layers of the sclera at 12 o'clock and 6 o'clock 1.5 mm. behind the limbus. I have found these sutures of great help in steadying the eye when the graft bed is being prepared and also when the graft is being laid in position. The type of eye in which corneal grafting is justified has in some instances roving movements over

which the patient is quite unable to exercise conscious control. All bleeding points are stopped by pressure or touching with a hot probe, and the conjunctival sac is irrigated with normal saline at 100° F. The speculum is then removed, and the lids drawn over the eye and covered by a pad of gauze wrung out in sterile normal saline.

The donor's eye is excised at this stage. Pantocain anaesthesia is used, and an injection of novocain into Tenon's capsule and underneath the conjunctiva and around the limbus. It is needless to remark that great care is taken to prevent drying or damage to the cornea. Immediately after excision the stump of the divided optic nerve is transfixed with a thick white suture, the ends of which are passed through the hollow central core of a special stand (designed by Tudor Thomas) and retained in place by placing the weighted base of the stand over the ends of the suture as they rest on a sterile towel. The eye is thus held securely in the socket of this stand. The operator moistens the cornea with several drops of warm sterile normal saline or Ringer's solution. The

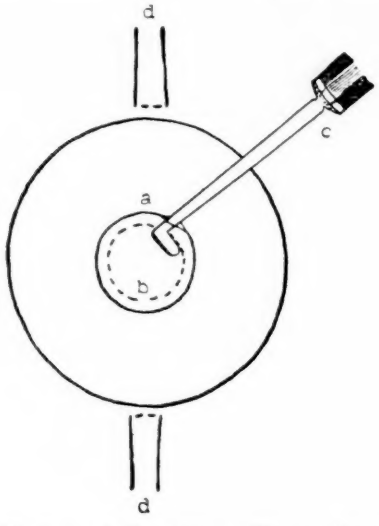


FIG. 3.—Diagram of the cornea. The continuous line (a) represents the trephine incision, the interrupted line (b) the incision in the deeper layers of the cornea. c is the corneal knife cutting obliquely through the deeper layers of the cornea. d d are fixation sutures in the sclera.

globe is surrounded by a thin gauze swab and gently grasped between the forefinger and thumb of the operator's left hand.

The site of the graft is outlined by placing the No. 1 trephine (4.5 mm.) over the centre of the cornea and making an impression sufficient to cut through the epithelium. The trephine is removed and a drop of sterile fluorescein placed on the cornea and washed off with normal saline. This outlines the site of the graft. The trephine is then replaced over this incision and a few sharp, almost complete turns are given to cut through half the thickness of the cornea. The trephine is then tilted to one side so that the cutting edge is directed obliquely through the deeper layers of the cornea. The anterior chamber is thus entered and about one-third of the circumference of the graft is completely divided, the deeper half being bevelled.

The trephine is removed and the section of the remainder of the deeper half of the cornea is completed by a series of short incisions, made with a corneal knife (see Figs. 3 and 4), sloping from within outwards and joining the line of the vertical trephine incision through the superficial half of the cornea (see Fig. 4).

The blade of the corneal knife is introduced into the anterior chamber on the flat and is then turned so that the 1.5 mm. cutting edge is set obliquely and is aimed to reach the line of the trephine cut on completion of the incision. The back and heel of this angular knife are blunt, smooth, and rounded, so that the iris and lens are not damaged, an important precaution to observe in cutting the bed for the corneal graft in the recipient's eye. The incisions with this knife are made with a gentle but firm sliding action. Attempts to pull the knife through the deeper layers of the cornea of course fail to make a clean incision, and are liable to distort and injure the cornea to an unnecessary extent.

A series of short (about 1 mm. or less) cuts set obliquely and making a small angle with each other are made until about the last millimetre of the circumference of the graft remains undivided. At this point the corneal disk is too mobile to cut effectively, and it is obviously undesirable to steady it by holding the edge with forceps. So the corneal knife is laid aside and the severance of the graft completed by an oblique cut with a special pair of scissors.

It was my intention to leave the divided graft *in situ* in the donor's cornea until it was required, covering it in the meantime with a fine gauze swab soaked in warm normal saline and raised up over the graft area like a tent, the base of the swab resting on the cornea and sclera surrounding the graft. However, in human eyes the lowered intraocular pressure resulting from excision and then trephining causes the cornea to collapse, and so the graft is in danger of being tilted into the anterior chamber, from which it would be difficult to extract it without damage. I believe this difficulty could be obviated by keeping the sclera compressed sufficiently to displace the lens and iris forwards so as to act as a mechanical support for the posterior surface of the cornea. The corneal graft is removed by sliding a smooth flat spatula 4 mm. broad beneath it and then placing it in a warmed watch glass filled with sterile normal saline at 100° F.

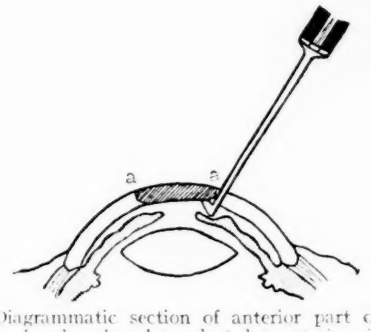


FIG. 4.—Diagrammatic section of anterior part of eye after the anterior chamber has been lost by entering it with the trephine. a a show the corneal incision at right angles to the surface of the cornea through its superficial half, and then shelving through the deeper layers. The corneal knife is drawn at the angle necessary to effect incision through the deeper half of the cornea to meet the trephine cut. The shaded area represents the excised piece of cornea.

It is obvious that it is desirable that the minimum amount of time should elapse between preparing the graft and placing it in its bed in the recipient's cornea. The recipient's eyelids are retracted by the sutures, which are clamped to the sterile towels. The bed for the graft is prepared in a similar manner to that in which the graft is cut.

The assistant holds the two sutures through the sclera at 12 o'clock and 6 o'clock respectively, so that the eye is kept still and does not rove aimlessly about.

Great care must be exercised not to damage the iris or lens when the trephine (4.63 mm. diameter) penetrates into the anterior chamber and then later when the corneal knife is manœuvred to divide the deeper half of the remaining circumference of the graft bed.

Some assistance is afforded in making these incisions by holding the cut edge of the opaque corneal disk in straight, fine-toothed iris forceps. Fixation by this means enables the operator to complete the shelving of the graft bed without having recourse to the use of scissors in the terminal stage of severing the corneal disk. The corneal disk is now removed and the state of the lens and iris underlying the corneal bed may be examined. If an anterior synechia is present in the vicinity of the graft bed it should be divided and the iris swept clear of the posterior surface of the cornea by a bent iris repositor.

The corneal graft is floated on to the upper surface of the broad spatula, which has been dipped in warm normal saline, and is transferred to the corneal bed. With the

minimum manipulation the graft is fitted as accurately as possible into its bed. The surface of the graft should be flush with that of the surrounding cornea. The conjunctival flap is drawn firmly and gently over the site of the graft in the manner of a tent, keeping the deep surface of the conjunctiva clear of the graft until the purse-string suture has been drawn together and tied. The ends of the suture are held up and the conjunctiva allowed to drop gradually over the site of the graft. The ends of the suture are then cut, two or three drops of sterile atropine, 1 per cent., and ol. paroleine are instilled into the conjunctival sac ; the lid margins are smeared with sterile vaseline, and the upper lid drawn down over the eye and the lid suture strapped to the cheek.

The lower lid suture may be retained to facilitate opening the eyelids when dressing the eye, and thus to prevent any accidental pressure on the globe. A Cartella shield, covered with sterile gauze, is strapped over the eye, and the patient placed in the dorsal position with one pillow.

Pre-operative Treatment

It is as well to leave the patient in the dorsal position for three weeks, a time considered necessary for the graft to take securely. No dressing need be done for three or four days after operation, and then all that is necessary is to swab the lid margins and instil a few drops of gutt. atropin., 1 per cent., and ol. paroleine. The lid margins are then smeared with sterile vaseline and closed over the eye. After this it is seldom necessary to do more than dress the eye as described above on alternate days.

Dilatation of the pupil to a point which enables the iris to be clear of the graft and not to form an anterior synechia is desirable. An adhesion between the iris and the graft leads to its opacification and vascularization. About the sixth day the centre of the conjunctival flap opens and exposes a small area of the graft, and by the eighth day the conjunctiva has receded enough to display completely the grafted area. The conjunctival sutures are removed on the eighth day, and the conjunctiva gradually recedes to the limbus during the ensuing week or ten days. The eye may be protected from injury and from the effects of light by the use of a Kirkpatrick transparent shield, tinted to correspond approximately with Crookes's B.1 blue glasses, moulded over the appropriate area of the patient's face and held securely by tapes tied round the head.

BIBLIOGRAPHY

Castroviejo, R.: *Amer. Journ. Ophthalmol.*, 1932, xv, 825.
Elschnig: *Graefe Saemisch Hdb.*, Ed. III ; *Augenärztliche Operationslehre*, 1922, Bd. 1, p. 514 ; *Arch. of Ophthalmol.*, 1930, iv, 165.
Elschnig and Gradle: *Amer. Journ. Ophthalmol.*, 1923, vi, 998.
Von Hippel: *Arch. f. Ophthalmol.*, 1888, xxxiv, 108.
Rycroft, B. W., and Handelsman, G.: *British Medical Journal*, 1935, i, 919.
Stallard, H. B.: *Brit. Journ. Ophthalmol.*, 1935, xix, 459.
Tudor Thomas: *Trans. Ophthalmol. Soc. U.K.*, 1930, l, 127 ; 1931, li, 88.

ASPIRIN POISONING

BY

A. VICTOR NEALE, M.D., M.R.C.P.

ASSISTANT PHYSICIAN, QUEEN'S HOSPITAL, BIRMINGHAM

Severe toxic and even fatal results have been observed from the common, homely remedy known as aspirin. The ease with which aspirin, or its chemical equivalents, can be obtained renders the occurrence of poisoning therefrom a possible problem of diagnosis and treatment in the day's work of any medical practitioner. The drug may be classified among those which produce noxious action after a relatively long period of time following ingestion, and, since the progress of the symptoms and signs is somewhat gradual, it is not unusual for many hours to have elapsed before the person taking the drug comes under medical observation. Since a very large dose is necessary to produce dangerous symptoms, the patient suffering from aspirin poisoning has generally taken the drug with suicidal intentions. There is evidence to indicate, however, that some persons who are considerably debilitated through acute or chronic illness may be unsuspectingly susceptible to an amount of the drug which in a physically healthy person would cause but relatively slight disturbance. Personal idiosyncrasy is also known, and rapid allergic type symptoms may occur.

It is the purpose of this paper to make some observations on several cases of aspirin poisoning which have occurred in Birmingham.

A Case with Recovery

The patient was a female aged 52, whose previous health had been fairly good, except for periodic mental depression. On August 9th, 1935, at 4 p.m., she took about one hundred 5-grain tablets of aspirin made up in a mixture with milk. At 7.30 p.m. her husband found her looking rather ill and gave her a small drink ; she vomited a little afterwards. Two hours later she was admitted to hospital in a semi-comatose state. There was profuse sweating and pallor. Respiration rate was 35 per minute and a little shallower than normal ; pulse rate was 105 and poor in volume. The pupils were normal. The patient could be roused to answer some questions.

Soon after admission to the ward the stomach was washed out with several pints of weak sodium bicarbonate solution, and ten ounces of warm coffee passed into it. The urine showed a light cloud of albumin and a high content of salicylic acid. Lumbar puncture was carried out, and 30 c.cm. of clear cerebro-spinal fluid were allowed to escape slowly ; the fluid was under a moderately increased pressure. The high degree of sweating continued. Soon after the lumbar puncture there was definite clinical improvement, but respiration remained quicker than normal and somewhat deeper than on admission. The mental power of the patient became clearer, and she complained of a choking sensation in the throat and some pain in the back of the head. About eighteen hours after admission the alkali reserve of the blood was 40 volumes per cent., which indicated a moderately grave compensated acidosis.

The patient had received 60 grains of sodium bicarbonate four-hourly for twelve hours and ample fluid by the mouth. Twenty-four hours after taking the aspirin her general condition was very much improved ; but she had then developed considerable deafness with tinnitus, and she indicated the presence of a subjective feeling of pressure in the head and a feeling of constriction round the skull. She felt as though she was being lifted up in the air, a sensation that disappeared quickly when she sat up in bed for a few minutes. Profuse sweating continued for thirty-six hours. The blood pressure returned to 122/80. There had been no objective changes in the nervous system. A reactionary pyrexia reaching 100° F. occurred after forty-eight hours. The respiration rate and pulse rate declined to normal after three days. The urine was entirely free from salicylic acid four days after admission.

A Case from the Literature

In comparison with the above I should like, at this stage, to include certain observations of S. C. Dyke on a case of aspirin poisoning recently published in the *Lancet*,[1] inasmuch as his case reveals a series of clinical phenomena of considerable interest and importance.

In summary, Dyke's case came under medical observation a few hours after the patient, a young woman, had consumed probably 435 grains of aspirin, the symptoms and signs at that time being nausea and tinnitus, leading to deafness and mental wandering a few hours later. Restlessness and disorientation were the phenomena observed during the following night, and by the next morning stupor and signs of cerebral irritation were evident. Respiration was deep and

slow, and considerable dehydration had ensued. The patient was treated with fluids and glucose enterally during the day. On the evening of the next day (thirty-six hours after the drug had been ingested), the patient's condition was much the same. Lumbar puncture was performed and the pressure found to be 180 mm. water. Cerebro-spinal fluid was removed until the pressure declined, and as a result there was much improvement. The procedure was repeated later with further benefit. (Salicylic acid was found in abundance in the cerebro-spinal fluid.) Seventy-two hours after the onset the patient's physical condition was a great deal better, but the mental processes were still dull. She complained that her head felt enormously large, and she performed curious stroking movements of the hands towards the scalp. The vision was streaked and barred. Visceral damage had occurred during the toxaemia, as indicated by albumin and bile salts in the urine. Later observation indicated complete recovery.

Notes on Four Fatal Cases

An unfavourable result must be recorded in each of the following cases.

Case 1.—A man aged 45 was the subject of chronic depression. He left home one morning at 10.30, and on his return home at 11 p.m. he was perspiring very freely, was somewhat disorientated, and was unable to give any account of his movements during the day. His breathing was heavy and laboured ; he appeared strange in his manner and cyanosed. His underclothing was saturated with perspiration and he complained of great thirst. A few hours later (probably about twelve hours after the aspirin had been taken) he became delirious, and shortly afterwards, during a series of convulsions, he died of cardio-respiratory failure. Search revealed two aluminium aspirin bottle tops in his coat pocket. Necropsy confirmed the suspicion of aspirin poisoning. The exact amount of aspirin that he had taken during the day could not definitely be ascertained.

Case 2.—A man aged 72 was subject to attacks of mental depression. On May 1st, at noon, he went out, returning home at 4.30 p.m. He had some tea to drink and then went upstairs, after asking for assistance in taking off his boots. He was observed to be unusually tired and somewhat strange in his manner. At 6 p.m. he called a relative and said he was "feeling bad" and that he had poisoned himself. He had taken 150 tablets of aspirin during the early afternoon. He vomited some dark-coloured fluid, and profuse sweating was noted. He volunteered the remark that he thought the poison would have acted much more quickly. Death occurred approximately twelve hours after the drug had been taken.

Case 3.—A man aged 50 decided while staying in a hotel to end his life ; he wrote to a relative to that effect, indicating that he would be dead before the letter arrived next morning. The relative visited the hotel immediately he received the letter, but found the man had left. He proceeded to the man's home, and at 11.30 a.m. found him in a semi-stuporous condition. Information was given, however, to the effect that he had taken 200 tablets of aspirin while in the hotel, with the hopeful expectation of rapid dissolution. His hopes were not fulfilled, so he decided to walk to his home, where he gradually passed into coma and died—probably about twelve hours after he had taken the aspirin.

Case 4.—A man aged 38 had suffered from a tuberculous hip for several years and was in the habit of taking up to 30 grains of aspirin to relieve the pain. On February 28th he took 40 grains, and during the next few days he continued to take large doses every few hours. Vomiting occurred at intervals, and later he was quite unable to retain any fluids. Dehydration became considerable. During a period of thirty-six hours he took about 200 grains of aspirin. He became semi-conscious and remained so for about forty-eight hours, when he died.

Several interesting phenomena emerge from these cases. The onset of recognizable symptoms is usually delayed for a few hours, this interval probably bearing direct relation to the rate of absorption of the drug. Although gastro-intestinal irritation, with associated vomiting, may occur, the leading clinical disturbance is connected with the nervous system, and, in the untreated case, reaches its crescendo in the course of twelve hours or more, when dissolution may take place as a result of profound cerebral depression. Progressive diminution of function can be traced from the higher to the lower nerve centres. Disturbance of heat regulation occurs, and profuse sweating may be regarded as an important clinical sign in the diagnosis. The type of respiration seems to vary in different cases, and typical "acidosis" breathing is not invariably seen.

The toxic effects of acetylsalicylic acid are potentiated by associated dehydration, which is likely to reach a major degree as a result of the respiratory changes, the very considerable perspiration, and the prolonged effects of the drug. Auditory and vestibular disturbances are outstanding in some cases. Reference to the patient's mental state, the presence of severe perspiration and of respiratory changes, and examination of the urine for salicylic acid should enable the diagnosis to be made. A period of several hours usually elapses before dangerous cerebral phenomena arise. Acceleration of these latter signs may occur in a person debilitated by previous chronic disease. The dangerous dose of aspirin probably varies considerably around 400 to 500 grains, but, in the light of more recent observation on the beneficial results of treatment, lethal effect may be avoided even when more than 500 grains are ingested.

Dyke has outlined, in the report of his successfully treated case, the principles of treatment in salicylic acid toxaemia. The visceral action of the drug is considerably intensified by the associated dehydration, and it is therefore imperative to combat the depletion of tissue fluids and especially to encourage and retain adequate renal secretion. If enteral fluid cannot be received, the continuous intravenous drip method (glucose saline) should be used. Excretion of the acid occurs in the sweat and the urine. The cerebro-spinal fluid contains the drug in considerable amounts, and, undoubtedly, lumbar puncture played a leading part in the recovery of the patient in two of the recorded cases. No such treatment, however, was carried out in the four fatal cases. It seems reasonable to believe that even when symptoms and signs in this form of poisoning have reached an advanced stage, the combined therapeutic effect of the introduction of fluid to the body and the simultaneous aspiration of the cerebro-spinal fluid will be a means of saving an otherwise hopeless situation. In fact, the efficacy of such rational treatment is revealed in this paper.

I must express thanks to Dr. W. H. Davison, H.M. coroner for the city of Birmingham, for his kind permission to utilize certain records in his department.

REFERENCE

[1] Dyke, S. C.: *Lancet*, 1935, ii, 613.

The American Association for the Study of Goiter again offers the Van Meter Prize Award of 300 dollars and two honorable mentions for the best essays submitted on the goitre problem. These essays should not exceed 3,000 words, be presented in English, and a typewritten double-spaced copy must be sent to the corresponding secretary, Dr. W. Blair Mosser, 133, Biddle Street, Kane, Pennsylvania, not later than March 1st, 1936. Manuscripts received after this date will be held for competition next year or returned at the author's request. The committee did not consider any of the manuscripts submitted at the last annual meeting to be of a calibre to justify the award, and consequently the award for 1935 was withheld. The association will publish the winning manuscript in its annual *Proceedings*, and reserve a place on the programme of the annual meeting for presentation of the manuscript by the author, if he is able to attend. This will not prevent its publication, however, in any journal selected by the author.

Clinical Memoranda

Relative Frequency of Certain Skin Diseases

There are, I believe, no recent statistics illustrating the frequency of skin diseases in the British Isles. The statistics of hospital and private dermatological practice cannot, of course, give any accurate estimate. For example, zoster, which must be one of the commonest dermatoses in general practice, is hardly ever seen by the consultant; epithelioma at different times and in different places is sent to the surgeon, or even to the radiologist, and plantar warts to the chiropodist. Again, different methods of diagnosis may, for example, alter the proportion between eczema and dermatitis. The numbers of alopecia, rosacea, and acne—which are dermatoses mainly of cosmetic interest—vary according to the length of the public purse and the activity of beauty parlours.

Disease	J.H.T.D. Private Practice, 3,000	Radcliffe Crocker. Private Practice. Adjusted to 3,000	R.S.C.H. 3,000	Brighton Children's Hospital. 500 Cases seen during same Period as Third Column, Adjusted to 3,000 for Comparison	St. Bart's.	L.H.	U.C.H., R. Crocker
					1929	1929	1903
					2,657	5,473	10,000
					Numbers adjusted to 3,000 for comparison		
Seborrhoeic eczema, etc.	406	127	227	84	123	395	127
Eczema and cheiropompholyx	398	585	484	438	269	156	585
Warts, including plantar warts	353 (273)	28	167 (33)	162	146 (18)	80 (3)	2
Pruritus lichenification, nevrodermite, pruritus ani	262	76	120	6	59	203	27
Acne vulgaris, seborrhoea, etc.	171	186	119	18	118	85	74
Psoriasis	168	180	151	66	138	121	215
Dermatitis 'exogencus)	158	22	227	138	450	200	7
Tinea	124	91	82	174	100	137	392
Epithelioma ...	111	25	123	0	33	68	2
Alopecia	110	452	100	36	332	275	75
Impetigo etc. ...	96	30	119	216	322	275	290
Rosacea	89	180	68	0	40	13	60
Urticaria	72	112	80	186	46	163	130
Lichen planus ...	60	70	37	0	30	26	29
Lupus erythematosus	53	54	20	0	16	18	19
Vascular naevi ...	51	7	96	954	105	54	1
P. rosea	49	37	63	18	66	5	12
Scabies	36	35	77	90	117	90	238
Ulcus cruris ...	36	0	175	0	25	35	0
Syphilis	23	76	36	6	Not given	44	180
Lupus	16	30	15	12	12	30	38
Artefact	11	0	24	6	3	22	1
Pediculosis ...	8	4	5	12	5	26	117
Zoster	8	18	13	12	12	30	38
Molluscum contagiosum	4	7	2	0	10	5	6

It will be seen that, contrary to the impression given by Dr. Herman Lawrence's paper (*Journal*, September 28th, 1935, p. 572), so far from "hardly coming into the picture at all," epithelioma is sixth in my hospital list, ninth in my private list, eleventh in that of the London Hospital, and sixteenth at St. Bart's. On the other hand, I had only thirteen cases *complaining* of keratoma senilis in private and nine at the hospital, while at the London Hospital they had nine in 5,473 cases and one in 2,656 at Bart's. This again illustrates a fallacy of such statistics as these. It is obvious that many people complaining of epithelioma had keratoses as well, but only the more important diagnosis was recorded.

However, the numbers of lupus erythematosus, with its traditional predominance in private practice, psoriasis, lichen planus, and others which are easily and certainly diagnosed, seem to show that such figures as these are not altogether valueless.

I have included the twenty commonest diagnoses together with a few others, such as pediculosis, artefact, lupus, zoster, and molluscum contagiosum, the frequency of which has been very variously estimated, particularly the last, which I am told is very common indeed in Edinburgh. Space will not allow me to give a complete list. I may mention that my lists and those of St. Bart's and the London Hospital each contained about 175 different diagnoses, while nearly 80 per cent. of all the cases could be included under twenty of these headings.

I am indebted to Drs. A. C. Roxburgh and W. J. O'Donovan for permission to use their figures.

J. H. TWISTON DAVIES, M.B., B.Ch.,
Dermatologist to the Royal Sussex County Hospital, Brighton.

Herpes Zoster as a Sequel to Lightning Trauma

A large proportion of cases of herpes zoster occur in young adults, and of the facial types affection of the supra-orbital branch of the trigeminal nerve is the commonest. The disease, however, is comparatively rare, and in view of the frequency of nervous lesions in lightning accidents it is highly probable that the herpes zoster followed the previous shock in the case reported below, although Critchley[1] in recent reviews does not mention this as a sequel to lightning trauma.

On September 27th, 1935, a healthy and athletic male, aged 25, was shaving during a severe thunderstorm when a lightning shock flung the razor from his left hand and sent a stabbing pain up the left arm. No immediate ill effect apart from slight shock was noticed, but on October 11th, exactly fourteen days after, severe pain was felt in the distribution of the left supraorbital nerve, and this was followed on the 13th and 14th by an outbreak of typical herpes zoster in the distribution of this nerve, including some vesicles on the upper left lateral aspect of the nose and some mild conjunctivitis of the left eye. There was no history of any previous medication or contact with cases of varicella or herpes. Recovery was without incident.

The possible relation of herpes zoster to varicella, as maintained by McCormick,[2] Netter,[3] and others is of interest here, for the incubation period was exactly fourteen days, presuming that the zoster virus attacked the injured trigeminal ganglion soon after the lightning shock, and the commonest incubation period of varicella is fourteen days (twelve to twenty-one days). Bruusgaard[4] and Kundratitz[5] found by inoculation experiments that the incubation period of herpes zoster was fourteen days or less.

D. N. PARFITT, M.D., M.R.C.P., D.P.M.,
Hatton. Deputy Medical Superintendent, Warwickshire and Coventry Mental Hospital.

REFERENCES

[1] Critchley, M.: *Lancet*, 1934, i, 68; *Bristol Med.-Chir. Journ.*, 1932, xlix, 285.
[2] McCormick, R. R.: *Journ. Amer. Med. Assoc.*, 1931, xcvi, 766.
[3] Netter, A.: *Bull. et Mém. Soc. Méd. des Hôp. de Paris*, 1932, 1194.
[4] Bruusgaard, E.: *Brit. Journ. Derm. and Syph.*, 1932, xliv, 1.
[5] Kundratitz: Quoted by Bruusgaard.

Reviews

ANTE-NATAL SUPERVISION

Professor F. J. BROWNE gives as one of the reasons for writing his book on *Antenatal and Postnatal Care*[1] "the inadequacy of its representation in obstetric literature." We accept his statement in so far as to recognize a frequent failure to appreciate the primary object of ante-natal supervision and the application of its principles to practice. His effort to remedy this inadequacy has the great merit of making clear at the outset that the object of ante-natal care should not be so much to discover abnormality as to "secure normality and a high standard of mental and bodily fitness." The lesson of ante-natal care as primarily a system of constructive hygiene is not, however, driven home as emphatically as it might have been had he kept himself strictly within the confines of his subject. The extensive excursions into purely natal regions make too close an approximation to the ordinary textbook of midwifery.

The author would seem to have begun with the determination not to exceed the limits imposed by his title, as the early chapters on abnormal presentations and positions do not go into details of management after the patient has reached the labour room. By the time multiple pregnancy is discussed rather more space is given to management during labour than during pregnancy; later, when cases of placenta praevia have passed from the ante-natal clinic to the ante-natal ward, the temptation to follow with the details of their treatment through labour ward and operating theatre is apparently too great to be resisted. Other sections, too, such as those on septic abortion and hydatidiform mole, pay a disproportionate degree of attention to treatment in the theatre for a book specifically designed to stress the ante-natal and preventive aspect.

Apart from this lack of balance the teaching conveyed by Professor Browne's book is eminently sound and practical. It opens with a historical chapter of great interest and highly instructive in indicating the important place the social, educational, and hygienic aspects occupied in the early development of a supervision then largely domiciliary. A study of the many lessons to be drawn from the ideals prompting those who initiated the supervision of the pregnant woman adds greatly to the missionary influence of the book, but doubt may arise whether those most in need of being thus influenced will discover the lessons particularly applicable to them. There is an admirable chapter on the hygiene of pregnancy, which, with the tables of dietary systems in the appendix, is especially helpful at a time when attention is so closely directed to the problems of nutrition during pregnancy. Another valuable chapter on the influence of the emotions on pregnancy and labour contains a brief but succinct account of the methods of training the pregnant woman to relax during labour—also a matter of growing importance. Other outstanding chapters are those on toxaemia of pregnancy and the series covering diseases and endocrine disorders complicating pregnancy. The subject-matter is throughout fully up to date, as indicated by the inclusion of material and diagrams from the literature of 1935, such as Reece's method of foetal cephalometry.

The author has performed a signal service in making available to others his wide experience in ante-natal work and the results of his researches on many of its problems. His book will serve both to improve efficiency in obstetric practice and to stimulate further research towards greater constructive effort.

[1] *Antenatal and Postnatal Care.* By F. J. Browne, M.D., D.Sc., F.R.C.S.Ed., F.C.O.G. London: J. and A. Churchill. (Pp. xvi + 480; 58 illustrations. 15s.)

TONSILS AND NASOPHARYNGEAL SEPSIS

Dr. E. A. PETERS has compressed a surprising amount of information into a small book entitled *Tonsils and Naso-Pharyngeal Sepsis.*[2] The subject is approached from an unusual point of view, which may be taken as the justification for yet another monograph on a subject so hackneyed. There is a careful microscopical study with some excellent illustrations, and from this pathological groundwork the author leads on to the general and local manifestations, and gives the fruit of many years of clinical observation.

If the author has nothing very novel to relate—and he is not the rider of a hobby-horse—yet he has contrived to collect a quantity of information upon many vague and debatable points and to present it in an attractive way. The book might have formed a section in an encyclopaedia or system of medicine, and it makes a very small volume, but it is full of good sense and advice, and deserves to be widely read. The subject is one upon which cranks and enthusiasts are particularly prone to let loose their activities, often with harmful effects, and Dr. Peters here supplies a sound corrective in a convenient form.

PHYSIOLOGY: NORMAL AND PATHOLOGICAL

Three more volumes of the comprehensive *Traité de Physiologie*,[3] edited by Professors ROGER and BINET, have appeared. Volume v deals with respiration, and the names of the authors of this volume—Messrs. Léon Binet, L. Dautrebande, H. Hermann, C. Heymans, and Pierre Thomas—are sufficient guarantee that the volume is complete and up to date. Professor Thomas deals with the theories of respiration, with particular reference to internal respiration. The latest views on such subjects as the functions of cytochrome and the respiratory enzymes, the oxidation-reduction phenomena, and so on are treated, with numerous references to original literature, mainly in French. Professor Binet considers the general physiology of respiration from the standpoint of histology and biochemistry. A study of gaseous exchanges based on the analysis of air and blood gases is contributed by Dr. Dautrebande, and the part played by the lungs in the general metabolism by Professor Léon Binet. This subject has received much attention in France at the hands of Professors Roger, Binet, and others, and this review of the results of their work is of interest. The part played by the pulmonary respiration in connexion with basal metabolism, together with the pathology of basal metabolism, is adequately dealt with by Professor Hermann, and the subject of the innervation of respiratory movements by Professor Heymans. This latter subject has developed so rapidly during the past few years that his fundamental treatment will be particularly valuable in securing a proper orientation. Lastly, Professor Binet contributes an important chapter on the pathological aspects of respiration, including in this section modern methods for the application of artificial respiration.

Volume x is divided into two parts. Part I deals with psycho-physiology (B. J. Logre), the cerebellum (F. Bremer), the medulla and pons (André Legrand), the spinal cord (N. Perron), the cerebro-spinal fluid, with a study of its formation, circulation, pressure, etc. (J. Haguenau), the physiology and pathology of the cranial nerves (Raymond Garcin), and the physiology of the sympathetic and parasympathetic systems (L. Garrelon, D. Santenoise, L. Merklen, and M. Vidacovitch). This

[2] *Tonsils and Naso-Pharyngeal Sepsis.* By E. A. Peters, M.D., F.R.C.S. London: Baillière, Tindall and Cox. 1935. (Pp. 92; 3 figures. 5s.)

[3] *Traité de Physiologie, normale et pathologique.* Vol. v, *Respiration.* Vol. x (two parts), *Physiologie Nerveuse.* Paris: Masson et Cie. 1935. (Vol. v, 80 fr.; vol. x, 220 fr.)

last chapter has numerous references and is quite up to date. The volume as a whole is valuable from the clinical as well as from the physiological standpoint. It is disappointing, however, to see so little mention of the large amount of work on reflex action which has been done in other countries—for example, the reference to the work of the Oxford school seems to be quite inadequate.

Part II of volume x deals with the special senses. The physiology of the skin and its general functions is in the hands of G. Milian, and the chapter on touch is by H. Pieron. The section on speech is by J. Froment, and that on hearing by A. Hautant and R. Caussé. Vision occupies two chapters, one on the optical properties of the eye, by A. Strohl, and one on the physiology of vision and the eye in general, by E. Velter. Taste is dealt with by A. and B. Chauchard, and smell by F. Lemaitre. The number of references is relatively small for so large a book. Those on the special senses include a good deal of recent work done outside France, but the references to classical work are somewhat scanty.

SIGMUND FREUD: AN AUTOBIOGRAPHICAL STUDY

This volume[4] was written ten years ago, and is not an autobiography in the ordinary sense, but a story of Freud's pioneer work in establishing the theory and practice of psycho-analysis, written by himself. At any rate for those closely acquainted with the master's work this is a most interesting and readable account, told in a simple and authoritative manner, and it is interesting to note the difference between the final rather bitter note which ended the original work in the year 1925 and the expression of quiet confidence which marks the postscript written in 1935.

Professor Freud traces the development of his life's work from his early contact with Charcot, through his studies in organic nervous disease, to his final concentration on the neuroses. He recounts his early association with Breuer, the latter's defection, and his long period of isolation, during which he worked out conflict and repression, the Oedipus complex, and the whole theory of infantile sexuality. Finally, he relates how psychoanalysis came to be applied to a wider field than that of medicine, and how it may throw light on poetry, the drama, and even religion. It is probable that all will agree that there is nothing new in this volume which does not appear elsewhere, but it is a very interesting and pleasant summary, which well repays an evening's study.

A HISTORY OF SCIENCE

In his book, *A History of Science, Technology, and Philosophy in the 16th and 17th Centuries*,[5] Professor A. WOLF has performed a task which puts every student of this period in his debt. Although complete in itself, this volume is only an instalment of a complete history of science, and the pedestrian reader can but gasp at the magnitude of the undertaking and at the Herculean effort that must be required to bring it to a conclusion. Professor Wolf, however, shares the view of other thinkers that our present age is one in which a narrow specialism has progressed too far to be intellectually healthy. An extreme of specialization leads to a hypertrophy that carries with it obvious dangers. Such a work as Professor Wolf contemplates, and part of which he has so notably completed, will lead, it is hoped, to a wider outlook on the "whole" activity of man as a thinking and acting animal. And in our own profession of medicine, particularly, is there at present an urgent need to eschew the evils of a facile specialism, and to this the study of such a history as Professor Wolf's will prove a wholesome corrective.

Starting with the "Copernican Revolution" he proceeds to a survey, which has in it a surprising amount of detail, of the progress of physics, astronomy, mathematics, chemistry, and biology in the period under review; giving full consideration to the technical discoveries that were made. In his chapter on medicine he points out that the famous doctors of this period were famous not "*as doctors*, but as pioneers in other fields of research—namely, in physics, chemistry, geology, biology, psychology, or philosophy"; and he refers to the view expressed by Paracelsus, that the best thing about the famous physicians of his time was not that they did much good, but that they did the least harm. In our time we refer piously to the *vis medicatrix naturae*, a principle upon which the great Sydenham based his treatment of the sick person. Professor Wolf says:

> "And, as has already been remarked, when he was not sure about the right medicine he preferred to give none, but to wait and see how the patient progressed, giving just a little help here and there, with simple diet, fresh air, refreshing small beer, suitable exercise, etc., so as to maintain the patient's strength while Nature completed the cure. Unpretentious and straightforward, a crusader against hocus-pocus in medicine, and a pioneer of critical, scientific method in the study and cure of human ills, Sydenham endeared himself to his generation and to after generations."

This is a fine tribute to the man who, in the tradition of the century in which he lived, sought to liberate medicine from the trammels of authority in an age in which, as Basil Willey says in *The Seventeenth Century Background*, "the main intellectual problem [was] the separation of the 'true' from the 'false.'" Those who wish to look upon the present age in true perspective should go to Professor Wolf's book and read in it the facts that were established and the fictions that prevailed in those two centuries which gave birth to the modern era in which we flounder.

TREATMENT OF PARASITIC INTESTINAL INFECTIONS

The authors of *Clinical Parasitology and Tropical Medicine*,[6] Drs. D. and C. DE RIVAS, have devoted considerable attention to the treatment of various parasitic infections of the intestine by the introduction of solutions at a temperature of 45° to 47° C. either into the large intestine per rectum or into the small intestine by way of the duodenal tube. For duodenal or intra-intestinal thermal treatment the solution most favoured is one named glycero-sulphate solution, consisting of equal parts of glycerin and thirty per cent. solution of magnesium sulphate. This is delivered hot through the tube, and is followed by physiological saline solution. For irrigation of the large intestine a hot solution of copper sulphate (1 in 5,000) is employed. By one or other of these methods the authors claim to have treated successfully all the intestinal protozoal and helminthic infections, together with other bacterial conditions such as bacillary dysentery. The exact details of this treatment are fully described in the book, which appears to have been written primarily with the object of bringing this method to the

[4] *An Autobiographical Study*. By Sigmund Freud, M.D., LL.D. Authorized translation by James Strachey. The International Psycho-Analytical Library. Edited by Ernest Jones. No. 26. London: Published by Leonard and Virginia Woolf, at the Hogarth Press. 1935. (Pp. 138. 6s. net.)

[5] *A History of Science, Technology, and Philosophy in the 16th and 17th Centuries*. By A. Wolf. London: George Allen and Unwin, Ltd. 1935. (Pp. 692; 316 illustrations. 25s. net.)

[6] *Clinical Parasitology and Tropical Medicine*. By Dámaso de Rivas, B.Sc.Biol., M.S., M.D., Ph.D., in collaboration with Carlos T. de Rivas, B.A., M.D. London: H. Kimpton. 1935. (Pp. 367; 144 figures, 1 coloured plate. 22s. 6d. net.)

knowledge of the medical profession. From the authors' account of its use it would appear to be the most reliable method of dealing with the various infections for which it is employed. Whether these claims will meet with general approval or not more extended experience alone will show.

If now the reader passes to other sections of the book he will find a mass of information about the various parasites which is quite sound, but the good effect of this is almost entirely spoilt by numerous inaccuracies and descriptions of most important matters which are quite out of date. From this point of view the book cannot be regarded as giving a modern account of clinical pathology and tropical medicine, and therefore can hardly be recommended to "students and practitioners in response to the demand for a treatise upon modern progress in tropical medicine and parasitic disease." Nevertheless, if anyone desires to carry out the authors' methods of treatment he cannot do better than follow the instructions given in this book.

Notes on Books

The appearance of a second edition of BLACKWELL and SOUTHWELL'S *Guide to Human Parasitology for Medical Practitioners* less than four years after the publication of the first edition is a sufficient indication that there was a distinct demand for a book of this kind. The publishers are H. K. Lewis and Co., and the price is 13s. 6d. The authors have modified it slightly by omitting certain matter that was not obviously essential, or that seemed on further experience to be incapable of proper treatment in an elementary textbook, which this claims to be. As such, it gives in an easily assimilable form all the essentials of human protozoology and helminthology, so that anyone who familiarizes himself with the contents of the book will have gone a long way towards making himself a competent parasitologist. Students who wish to study the subject can profitably begin with this book before attempting to read a larger treatise, while those who regard themselves as fully trained parasitologists will find it a handy source of reference for facts which may have slipped their memory. Well illustrated and printed, and supplied with numbers of diagnostic diagrams and tables, and remarkably free from errors, the book should form part of the equipment of every parasitological laboratory.

Vitamins in Theory and Practice, by LESLIE J. HARRIS, Sc.D., D.Sc. (Cambridge University Press, 8s. 6d.), is made up of the subject-matter of four "Thursday afternoon" lectures, given at the Royal Institution, London, in 1934. The author hopes that it "may be useful to many professionally interested—for example, to . . . medical men . . . and others." From a perusal of the book it seems not unlikely that, as far as medical men are concerned, he may be disappointed in this hope. For although "the history of vitamin discovery and research" is given at considerable length, medical men will probably turn to other books for a more comprehensive account of the role of vitamins in nutrition and of their relation to health and disease. It may surprise some readers to find the now hoary, though amusing, jingle—*the A B C of vitamins*—resurrected as an introduction to a book bearing the title of this one and issuing from the Nutritional Laboratory, University of Cambridge.

It seems to be required of nurses in these days of enlightenment that they should be acquainted with all sorts of things beyond the alphabet of their craft. To assist them to acquire that knowledge of medicine which is expected of them by examiners and which in addition should increase their interest and utility in their profession, Dr. W. GORDON SEARS has written *Medicine for Nurses* (E. Arnold and Co., 8s. 6d.). His book is based on the lectures he has been accustomed to give to the probationers in the various hospitals with which he has been connected, and it covers the syllabus laid down by the General Nursing Council. Dr. Sears says that one of his greatest difficulties in compiling the book was to know what to leave out; we can well believe it, but no fault can be found either in his choice of material or the manner in which it is set out. He is to be congratulated upon producing a book which should not only meet the needs of those for whom it is intended but should prove a valuable guide to any doctor who may find himself called upon to give a course of lectures on medicine to nurses.

In *Medical Procedures, Operative and Diagnostic* (published in Cairo by F. E. Noury and Sons), Dr. MOHAMED IBRAHIM and Dr. PAUL GHALIOUNGUI of the Kasr-el-Aini Hospital, Cairo, have collected descriptions of most, if not all, the technical details of procedures commonly used in the medical wards, such as aspiration of the pleural cavity, lumbar puncture, the taking of test meals, artificial pneumothorax, and so on. The procedures are well described, and the necessary apparatus is illustrated. This handy little volume should save the inquirer the trouble of delving into the larger and less accessible works of reference.

HOWARD C. WARREN'S *Dictionary of Psychology* (G. Allen and Unwin, 15s.) is designed to explain the meaning of technical terms which may be met with in psychological literature and which the psychological writer may wish to use in his writings. But contemporary psychology touches upon many other subjects, from neurology to folk-lore and religion, therefore many terms not strictly psychological are included. At the end is an appendix with numerous tables relating to such varied matters as statistical mathematical formulae, lists of reflexes, and sensory illusions. Finally there is a glossary of common French and German psychological terms. It is difficult to estimate how far this volume will be of real use to the student, but that it is a comprehensive and painstaking work there can be no doubt whatever.

In the third edition of *The Topographical Anatomy of the Dog* by Professor O. CHARNOCK BRADLEY (Oliver and Boyd, 25s.) the whole text has been revised in order to improve the book as a dissection manual. Certain parts have been rewritten, new matter has been introduced, and many new illustrations have been included. These add greatly to the instructive value of the text, many being in colour, and all being remarkably clear and informative. Tables are given of the arteries and cranial nerves. The book is excellently designed for its special purpose, and all unnecessary detail has been omitted.

Preparations and Appliances

MIXED ENZYMES

"Luizym" tablets (Medical Laboratories Ltd., 40, Pall Mall, S.W.) contain a mixture of enzymes. In addition to proteases, amylase, and esterases these tablets contain cellulase and hemicellulase. They are recommended for use in digestive disturbances associated with gas accumulation and flatulence. In particular, they are recommended for the preparation of patients for such *x*-ray examinations as pyelography, in which it is important to reduce the gas content of the bowels to a minimum.

DISSOLVED VACCINES G.L.

We have received from Glaxo Laboratories Ltd. a pamphlet describing a new immunological product—namely, Dissolved Vaccines G.L. The solution of the bacteria is effected with the aid of sodium lauryl sulphate. The process results in lysis of the bacteria and detoxication of the bacterial products. The makers claim that their process gives a product of uniform activity and low toxicity, which can be employed safely in high dosage. They also point out that the cost of the products is very moderate. The pamphlet describes a dozen varieties of vaccines. In the case of the whooping-cough dissolved vaccine the makers quote favourable clinical results obtained in both prophylaxis and treatment.

British Medical Journal

SATURDAY, JANUARY 18th, 1936

AN EDUCATIONAL PROGRAMME

Immediately before the recent general election the Government issued an outline of the proposals it intended to make towards educational reform. Some of these necessitated legislation ; others could be carried into effect by administrative action alone. The two chief proposals in the former class were the raising of the age for compulsory attendance at school and the permission for local education authorities to make certain grants to the managers of voluntary (non-provided) schools to enable them to enlarge or adapt their accommodation with a view to reorganization on the lines of what is commonly known as the Hadow Report. Such legislation is to proceed immediately Parliament resumes its session next month. The Board has now issued a circular[1] to local authorities stating its intentions and proposals with regard to reforms and improvements which can be brought about with the co-operation of those authorities and without legislation. They concern the provision to be made, where necessary, for children under five years of age ; the encouragement of building developments by larger financial grants ; the facilitating of the conveyance of children to suitable schools, especially in rural areas, and the provision of midday meals at reasonable cost by similar financial aid ; the removal of the maximum limit now imposed upon the granting of special or free places in secondary schools ; the augmentation both in number and in value of State scholarships ; the encouragement of technical and art education, and of adult education in general ; and the completion or improvement of the arrangements for promoting the health and physical condition of those attending all types of school either through the school medical services or by the development of systematic physical education. Clearly, all these proposals are of great interest to the medical profession, and some of them require its active support and co-operation. A further circular, issued this week by the Board of Education and summarized at p. 124, points out the main directions in which the system of physical education in this country needs improvement and expansion.

The importance of attending to the health of infants and of children between two and five years of age has been urged by the British Medical Association, and is now commonly recognized. The profession will endorse the statement of the Board that "in normal circumstances children under five years of age benefit more from being in their home surroundings, under parental care, than in school." Many would put the age at six rather than five years. It may be questioned, however, whether it is not the health authority rather than the education authority which should have the primary responsibility for these children in cases where home conditions make such parental care difficult or impossible. It is true that the distinction between the day nursery and the nursery school or even the lower classes in the infant school is not very marked ; but surely it is health in its wide connotation rather than any form of school training that is the main desideratum for these little children. Moreover, the public, and even some of those who occupy important administrative positions, need to be reminded from time to time that it is the Ministry of Health and not the Board of Education which is statutorily responsible for the initiation and direction of policy affecting the health of school children and the school medical service in relation thereto. It is only by delegation from the Ministry that the Board controls the detailed conduct of the service. This is as it should be if the proper co-ordination of health services is to be effected ; and the position was largely the result of the influence and efforts of the British Medical Association. A clear instance of the need for such co-ordination is the arrangements now being considered and developed for the physical improvement of the general population. The foundation for a strong and healthy physique is, no doubt, laid in the school or even in the nursery, but the need for recreative physical training continues long after the school age and extends far beyond the ranks of those who, even as adults, are attending any form of institutional education. It will be remembered that the recently formed Central Council of Recreative Physical Training is actively concerned in promoting better national efforts in this direction, and that the Association has appointed a very influential special committee on physical education whose report may be expected by the month of April next.

The points in relation to the actual school medical service to which the Board of Education directs the attention of local authorities are the dental service, the skilled treatment of crippling defects, the expert treatment of ear diseases, the establishment of day open-air schools for delicate children, the institutional treatment for children suffering or convalescent from acute rheumatism, the provision for difficult children and those of low-grade intelligence, and the accommodation for those who are partially blind and partially deaf. It is stated that in the opinion of the Board one dentist is required for, at most, 5,000 in urban areas and 4,000 in rural areas. This standard would mean a very large increase in the number of dentists employed, and this may be difficult to obtain. There are said to be seventy authorities which have not established any schemes for orthopaedic treatment. For many children suffering from crippling conditions and for many suffering from chorea and from rheumatism and rheumatic carditis residential provision of long duration is needed, and for the proper education of these patients the Board and local education authorities are responsible. This is not always sufficiently realized. The circular further

[1] Circular 1444. Administrative Programme of Educational Development. H.M. Stationery Office. 1936. (2d.)

states that "additional day special schools for mentally defective children are not, as a rule, urgently required." There may well be a difference of opinion about this; but of the need for increased residential provision there can be no doubt; nor can there be any hesitation in endorsing the view that in many industrial areas the provision of open-air day schools would be of the very greatest benefit to large numbers of children.

It will be seen that the volume of improvement that can be effected without further legislation is, in total, very great. The Board recognizes that these proposals can be put into effect only with the cordial co-operation of all partners in the educational system, whether local authorities, voluntary bodies, or teachers; and there is no doubt that such co-operation will be forthcoming. The Board does not mention the school doctor or the medical profession in this category: nevertheless it can be assured that the profession, collectively and individually, will not be behindhand in lending its essential aid.

HYDROLOGY, OLD AND NEW

One would not expect to find much in common in the spas of the eighteenth and those of the twentieth century. In most branches of medicine thought and practice, and indeed the devotees of the healing art, have changed out of recognition in two hundred years, although it is true that now and then new developments bring to light forgotten truths dating from even more remote periods. In the eighteenth century a new chapter was opening at the English spas, when, in addition to their more serious uses, they had the ambiguous advantage of becoming centres of fashion and amusement. Tobias Smollett, the forcible Scotsman and medical novelist, was a good representative of that period. He had also considerable acquaintance with spas: Bath and Harrogate, Scarborough, Aix-les-Bains, the French Riviera, and Lucca in Italy. *Roderick Random*, *Humphrey Clinker*, and *Peregrine Pickle* throw many sidelights on the health resorts, with shrewd comments on contemporary medicine. In 1752 appeared his *Essay on the External Use of Water*, now reprinted and edited with an admirable introduction by Claude E. Jones for the Institute of the History of Medicine in Baltimore.[1]

Smollett argues that for external use one water may have little advantage over another, although in 1762 he appears to have benefited from the waters of Bath and writes enthusiastically on the "cure" to his friend William Hunter. It was about this period that Dr. John Summers of Bath wrote an excellent and temperate account of the success of warm bathing in paralytic disorders. The advice appears to have fallen upon deaf ears, but it is interesting to note that this perfectly safe and rational practice has been recently revived with encouraging results in England, America, and other countries. In his advocacy of the medical use of pure water and sea water Smollett was far in advance of his time. From boyhood he had used a "cold tub," and at 41 years of age, before the appearance of Richard Russel's famous work, he writes of his twentieth day of sea bathing at Boulogne "with benefit which almost transcends belief." He had taken the douches then introduced at Aix-les-Bains, and held that "cold aspersions," combining the effects of low temperature, pressure, and moisture, were especially beneficial in chronic disorders. But the method of *pumping*, as practised at Bath, had the additional advantage that the momentary intervals between the strokes impart an oscillatory motion with alternate contraction and dilatation of the vessels. Some of Smollett's ideas in physical medicine are still very much alive. He points to the increase in the volume of the limb immersed in the hot foot-bath owing to the extreme relaxation of the vessels, and praises local applications of heat for the relief of general tension in spasmodic affections and fevers. He notes the presence of gases in thermal and "acidulous" (CO_2) waters, and complains that the natural gases are not employed at the "great hospital of the nation [at Bath], frequented by all the valetudinarians whose lives are of consequence to the Commonwealth"; and again that "no histories are published of the results of the cure," for the subscribers have a right to see "the uses and virtues of the waters ascertained."

That was a surprisingly modern and enlightened view of the opportunities and obligations of a great spa, for in the eighteenth century the chemical and physical properties of waters were almost unknown and thermometers were little used for outward applications. The practice of hydrology was consequently empirical in the true sense of that much-abused term, deriving skill only from experience. Modern hydrology bases itself on far more knowledge than heretofore of the processes of chronic disease and also of the actions of waters and baths upon the body. But, as in past times, daily observation of the patient under treatment is the practitioner's chief guide. Who shall best draw Truth from the well of experience?

[1] *An Essay on the External Use of Water*. By Tobias Smollett. Edited, with Introduction and Notes, by Claude E. Jones. H. Milford, Oxford University Press. (4s. 6d.)

THE PATHOGENIC AEROBIC ACTINOMYCES

All those who make a study of medical microbiology will readily agree that the position with regard to those micro-organisms variously referred to as actinomyces, streptothrix, nocardia, etc., is most unsatisfactory. What is their generic status and how are they to be classified? Have they a sexual form of multiplication or a complicated life cycle? These are some of the questions that await a satisfactory answer. Much of the confusion which exists can be attributed to the fact that cultures investigated and described in the literature have quite often been allowed to die out, with the result that accurate comparative study by up-to-date methods has frequently been impossible. During the course of years the National Collection of Type Cultures, maintained by the Medical Research Council at the Lister Institute, has received a number of organisms belonging to this group which have been isolated, in many instances, from human or animal lesions. Many of

these cultures were presented by Dr. A. G. Gibson of Oxford, who has been particularly interested in this group of micro-organisms. Recently Miss Dagny Erikson has made a study of these various strains of ray-fungi maintained in the National Collection, and her findings have now been published in a report[1] to the Medical Research Council. The material examined by Miss Erikson comprised some fifty strains of ray-fungi. The cultural characters of these organisms were examined on ordinary media and their morphology studied partly by means of impression preparations made from Petri plate cultures, but principally by direct observation of slide micro-cultures according to the technique of Örskov. Those who are interested in this subject will, of course, study Miss Erikson's monograph, but some of her principal findings might be indicated here. Örskov's classification into three main groups, *Cohnistreptothrix, Actinomyces, and Micromonospora*, was found to be the most suitable of the various classifications proposed. This grouping is based on morphological and cultural characters, the presence or absence of aerial hyphae, and the mode of spore formation. With one or two exceptions Miss Erikson was able to classify these fifty strains, and show that they comprised no fewer than twenty-five species, of which fifteen were entirely new. These cultures were observed over a period of fifteen months, and in no single instance was a complete transformation of morphological or physiological characters noted. From time to time individual characteristics might vary with different conditions of cultivation, but apart from this the species remained quite constant in their characters, and Miss Erikson does not subscribe to the view that these ray-fungi possess a complicated life cycle in which one of the stages is filterable, although she did not actually investigate this question of a filterable phase. Further, she was unable to obtain any evidence that these micro-organisms possessed a sexual mode of multiplication.

[1] Medical Research Council, Special Report Series, No. 203. London: H.M. Stationery Office.

POISONING BY CARBON BISULPHIDE

The Factory Department of the Home Office has issued a memorandum (Form 836[2]) on precautions against the dangers of poisoning, fire, and explosion associated with the use of carbon bisulphide in artificial silk, india-rubber, and other works. This colourless liquid is used in various industries—for example, in the manufacture of artificial silk and dipped rubber goods, and in the vulcanizing of rubber. It readily vaporizes at ordinary temperatures, and a mixture of 19 volumes in 1,000 of air is explosive. Chronic poisoning arises from the continued inhalation of small quantities of the vapour for some weeks or months, the first symptoms being nausea, indigestion, and giddiness, and emotional disturbances of the hysterical kind. An appearance of anxiety, with sweating of the hands and forehead, is suggestive ; in the next stage the mental disturbance increases, and is accompanied by impairment of memory, mental dullness, and depression. The speech may be affected, and a contraction of the visual fields, with diminution of the power of accommodation, can be detected. One of the earliest symptoms of chronic intoxication is muscular weakness due to toxic neuritis, the first muscles to be affected being those of the face and the flexors of the forearms. Tremor, paraesthesia, and loss of sensation are present, and optic neuritis is a late complication. Great difficulty in walking ensues, and leads to paralysis, confinement to bed, and inability of the patient to feed himself. Recovery in the less advanced cases is slow but usual after removal from the vapour ; in the advanced cases permanent effects remain. Poisoning by carbon bisulphide in a factory or workshop is compulsorily notifiable, and since 1924 eighteen cases have been notified. The memorandum details the more important preventive measures, among which is the medical examination of workers exposed to carbon bisulphide at intervals of not more than one month. Information is also given about the storage and pipe conveyance precautions which have been found necessary, and also how explosions should be guarded against.

[2] H.M. Stationery Office. (3d. net.)

CONTROL OF PASTEURIZING PLANTS

The present advertising campaign of the Milk Marketing Board and the recent recommendations of the League of Nations Committee on Nutrition render it increasingly important that the milk supplied to the general population should be free from the risk of causing disease. Since, as several investigations have shown, the raw milk of this country is frequently infected with pathogenic organisms, and since there is no immediate prospect of preventing its contamination from bovine and human sources, the only practicable method of protecting the health of the human consumer is to expose the milk to some form of heat treatment. Of the various forms of treatment available, the most widely used is low temperature pasteurization. In this process the milk is heated to 145–150° F., held at this temperature for thirty minutes, and subsequently cooled to 55° F. or below. Only milk that has passed through specially licensed plants is allowed under the Milk (Special Designations) Order to be labelled "Pasteurized," but in fact a great deal of so-called pasteurized milk is sold that has not been produced under the supervision of the health authorities. Milk of this type is often imperfectly processed and may still contain small numbers of living pathogenic bacilli. In the interests of everyone it is highly desirable that pasteurization should be adequately performed. Far too little attention has so far been paid to its regulation and efficiency. The publication by Dr. A. W. Scott and Dr. Norman C. Wright of a report[1] dealing with the results of an inquiry into the design, operation, and efficiency of pasteurizing plants will be welcomed by milk processers and sanitary inspectors alike as affording clear and detailed information on the treatment of milk by the holder method of pasteurization. Several technical faults in design and operation of plants at present in use in Scotland are exposed, and suitable remedies suggested. Though a number of unlicensed plants were found to be inadequately pasteurizing the milk, it is abundantly clear that perfectly safe milk, free from tubercle bacilli, can be, and is being, consistently obtained in many licensed plants by attention to the main factors concerned. Apart from the tech-

[1] *An Inquiry into the Design, Operation and Efficiency of Pasteurizing Plants.* By A. W. Scott, B.Sc., Ph.D., A.M.I.M.E., and Norman C. Wright, M.A., Ph.D. Bulletin No. 6. Published by the Hannah Dairy Research Institute, Kirkhill, Ayr. 1935.

nical control of pasteurization, three general proposals are made to improve the present position. The first of these is a suggestion that the Milk Marketing Board should offer a relatively larger margin of profit to distributors who agree to take out licences for the sale of "pasteurized milk." This measure, without in any way increasing the cost to the producer, would afford a stimulus to the distributor to install properly designed and supervised plant. Secondly, the need for training and certification of plant operators is stressed. In this connexion we may refer to the syllabus of instruction drawn up by the City and Guilds of London Institute, and mentioned in our issue of August 10th, 1935 (p. 263). Thirdly, an increase is recommended in the facilities available for routine laboratory control of milk. At present this is confined to a few of the larger companies. All of these proposals will receive support from public health workers. The report, which amplifies that recently published by the Ministry of Health, is another outstanding contribution made by the Hannah Dairy Research Institute towards improvement in the safety of our milk supply, and it is to be hoped that both central and local authorities will turn their serious attention towards implementing its main recommendations.

THE ENDOCRINE GLANDS IN HYPERTENSION

The presence in the body of endogenous products which exert powerful vaso-constrictor effects has naturally focused the attention of research workers on the relation between hypertension and certain endocrine glands, particularly the medulla of the adrenal and the posterior pituitary. Increased amounts of adrenaline in the blood of patients with hypertension have not, so far as we know, been detected. In a recent paper W. von Lucadon,[1] starting from the known fact that tumours of the adrenal medulla are associated with hypertension, seeks evidence of a disparity in the relative sizes of the adrenal medulla and cortex in post-mortem material from cases of hypertension. He compared the weights of the cortex and medulla of adrenals obtained from cases of diseases without cardiac involvement, of cardiac hypertrophy without hypertension, of chronic nephritis, and of hypertension. The ratio of medulla to cortex was found uniformly greater in males than in females, as the medulla is relatively heavier in the former. In cases of cardiac hypertrophy, whatever the cause, the adrenal medulla was heavier in relation to the cortex. No evidence of a preponderance of medulla in cases of hypertension was found, but there was some support for the view that where there is a functional increase in activity of the heart there is also a medullary hyperplasia of the adrenal, with, possibly, a chronic increase in formation of adrenaline. This work shows that any simple relation between the adrenal and hypertension is not to be expected. A. G. Marcano[2] gives the results of a histological study of seventy-five pituitaries obtained post mortem from forty-nine cases of essential hypertension, four of renal hypertension, and twenty-two from cases of disease without hypertension. Particular attention was paid to the basophilic cells, since several authors had stated that in hypertension either these cells were greatly increased in number in the anterior pituitary or that these cells passed into the posterior part of the gland. Interpretations of these changes were different with different authors, some claiming that the increase in basophils indicated that they exerted a regulatory function against the increased blood pressure, and others that their passage into the posterior lobe was evidence of a greater functional activity of this lobe. Marcano found a greater or less degree of basophilic wandering into the posterior lobe in nineteen cases of hypertension, but in thirty other cases there was no significant difference from the controls. This finding is related to the fact that the passage of basophils occurs in waves, and that in these thirty cases death had taken place between two such waves. Marcano also sought for a relation between the clinical picture of cerebral haemorrhage from hypertension followed by death and the appearance of basophils in the posterior pituitary. Of nine such cases, however, a definite wandering of basophils was found in only two. In six cases in which periods of from four to forty days had elapsed between the death of the patient and the time of recording a blood pressure of about 200, there was an excess of basophils in the posterior pituitary. A similar passage of basophils was not, on the other hand, found in a series of four cases in which the blood pressure had not exceeded 160 systolic—estimated one to fifteen days before death. In a further six cases in which the blood pressure had exceeded 220 systolic (estimated a few days before death) the passage of basophils was detected. The author rightly concludes that there is no constant relation between the degree of basophil wandering and the height of the blood pressure. He is led to believe that the increased activity of the posterior pituitary cannot be the sole cause of the hypertension, but that it may precede the increased activity of another endocrine, probably the adrenal.

[1] *Klin. Woch.*, 1935, xiv, 1529.
[2] Ibid., 1935, xiv, 1525.

FRENCH TUBERCULOSIS FIGURES

The annual report of the Statistical Bureau of the Comité National de Défense contre la Tuberculose for 1934 is a medico-social document that will repay study. It sets forth, in a way that grows more interesting the more one reads it, the position of the tuberculosis service in France, which differs considerably from that in England in that it is largely voluntary, and the results are collected by a central committee in Paris, and not by a Government Department. The organized control of tuberculosis in France began considerably before the war, but in 1918 the great majority of the Départements had no dispensary organization. To-day there are 834 dispensaries, of which 95 per cent. send their reports to the National Committee. A glance at the map shows that the dispensaries are most thickly organized in and around Paris, in the Rhine basin, and in Brittany, where the tuberculosis death rate is highest. Corsica and Morocco, however, are not forgotten. Like the number of dispensaries, that of actual patients goes up and up. Over 600,000 cases came under observation during 1934, and of these some 260,000 remain on the books at the end of the year. Such general figures mean little unless one has something with which to compare them, and the dispensary organization seems to vary greatly in efficiency in the different Départements upon which the administrative life of France is based. Thus the Department of the Seine, with nearly five million inhabitants, has sixty-one dispensary centres

and 224 visiting nurses ; whereas the Bouches-du-Rhône, with over a million people, has only seven dispensaries. The Nord, the highly industrialized northern region of France, with two million inhabitants, has thirty-three dispensaries, and the Côtes-du-Nord, with a population of over 500,000 and its very high death rate of over 250 per 100,000 living (much higher than anything in Britain), has its twenty-eight dispensaries and thirty-two visiting nurses. An interesting comment on the status of the tuberculosis dispensaries is in the figure given for the number of patients who were sent to the dispensary by medical practitioners. This in 1934 was not greater than 43 per cent., and it had risen from 24 per cent. five years previously. Taking the number of patients sent for institutional treatment, it is of interest to note that more than half of these were children under 15 years of age, who were sent to " preventoria " or sanatoria, or housed with families under the Grancher system. Over 340,000 persons were given institutional treatment during the year, but we are not told how long they remained in hospital. Pneumothorax treatment in France increases in popularity. Some 35,000 refills were given during the year, but this is said not to represent the full extent of the practice. In the tables dealing with treatment a special column is allotted to vaccination by the B.C.G. The extent of this seems to vary very greatly in the different Départements. In many of them no cases are mentioned at all. In the whole Department of the Seine, including Paris and its environs, nineteen cases were recorded. In the Côtes-du-Nord there were thirty-three, whereas in the Haut-Rhin (which includes such towns as Colmar, Mulhouse, etc.) there were 237. Here again the number given in the report is said to underestimate the extent of the practice. The death rate from tuberculosis in France, as in all " temperate countries," is falling, yet in eight Départements, including Paris and the environs, the Lower Seine, and the whole of Brittany, it is still over 200 per 100,000—a figure not reached in Britain since thirty years ago. The general death rate has fallen in the whole of France since the year 1901 by an average of 25 per cent., as against over 40 per cent. in England during the same period. The average tuberculosis death rate for France (1934) is 151 per 100,000 living, against seventy-four in England, the population of the two countries being roughly comparable. There is work waiting to be done upon comparative mortality statistics in tuberculosis.

AN APPEAL FOR HELP

Most readers of this *Journal* probably know of the existence of the Ladies' Guild of the Royal Medical Benevolent Fund, but we should like to draw attention to a practical way of assisting the Guild in which all members of the profession could play a part, however small. In addition to its many other activities the Ladies' Guild provides clothes to distressed members of the medical profession, and to their wives, widows, and children—and not only clothes, but such things as bed-linen, blankets, towels, curtains, carpets. Anyone with a family of his own can add to this list. The natural sympathies of those more fortunately placed must be stirred by the thought that the families of some of their professional colleagues are in such a plight as to be unable to buy things necessary just to keep them warm. But sympathy which is not followed by action becomes the kind of sentimentality described by William James—the sentimentality of the Russian lady who wept at the misery enacted on the stage while her coachman froze to death outside. May we therefore appeal to those who have left-off garments, old curtains, carpets, etc., to send them to the Ladies' Guild of the Royal Medical Benevolent Fund, B.M.A. House, Tavistock Square, London, W.C.1. From the Clothes Room in this house 546 parcels were sent off in one year to 351 persons. If everyone would send something—and continue to send each year—then a great burden of distress would be relieved.

RADIOGRAPHY, EXPERT AND INEXPERT

In the leading article with this heading last week we said in conclusion that " the ideal to be aimed at is probably that of a full-time radiologist. . . ." This expression has been construed by some readers as an advocacy of the abolition of the private radiologist in favour of whole-time salaried workers in hospitals. We wish to make it quite clear that by the words " full-time radiologist " we meant medical men engaged exclusively in the practice of radiology either in private work or in hospital appointments, or in both. Nothing was further from our wish than to suggest the abolition of the private radiologist, and we take the earliest opportunity of saying so lest any misapprehension should remain.

ENGLISH PERFIDY

Under the heading " Perfidi Inglese " in its issue for November 30th, 1935 (p. 1853), our esteemed contemporary *La Riforma Medica* refers to an annotation on page 847 of our issue of November 2nd, in which we stated that a British Ambulance Service for Ethiopia had been the outcome of a project originating some months earlier and that it had now received official recognition from the British and Ethiopian Governments under Articles 10 and 11 of the Geneva Red Cross Convention. We added that on October 21st the British Red Cross Society announced its collaboration with the B.A.S.E. After stating that the first dispatch of material, with the corresponding sanitary staff, was to have taken place about the middle of last November, *La Riforma Medica* declares that this is another proof, if any be needed, of the " English perfidy " in regard to Italy.

Mr. C. H. Fagge will deliver the Hunterian Oration before the Royal College of Surgeons of England on Friday, February 14th, at 4 p.m.

The Medical Secretary of the British Medical Association receives many requests from oversea medical bodies asking whether any doctors from this country are likely to be in their part of the world at the time of their annual meetings, the object being to invite such colleagues to take part in the discussions. He would be glad to be advised in good time if any member of the Association at home contemplates making a visit over-seas.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some diseases of the digestive system met with in general practice.

THE MEDICAL TREATMENT OF PEPTIC ULCER

BY

T. IZOD BENNETT, M.D., F.R.C.P.

PART II

In the last article a list was given of the types of case in which surgical treatment might be preferred to medical.

Perforation calls in every instance for surgical treatment: the treatment of haematemesis and melaena forms the subject of a special article in this series. Cases in the remaining groups often present a very difficult problem. In general a higher percentage of good results will be obtained by surgical than by medical treatment, but it is common to meet patients with one or other of the complications referred to in whom either there is a physique of poor quality ; or there is some complicating organic disease such as hypertension, a cardiac lesion, pulmonary tuberculosis, etc. ; or there is an invincible objection to surgical treatment. For such patients medical treatment is adopted, in spite of the belief that surgical treatment may be indicated.

Cases with some Degree of Obstruction

Cases with some degree of gastric, pyloric, or duodenal obstruction will show delay in the emptying of the stomach when examined by *x* rays. A residue of barium in the stomach four hours after ingestion is generally accepted as pathological, and it is by no means uncommon to see a case in which such a residue persists even twenty-four hours after the administration of barium. There is another important group of cases of juxtapyloric ulceration in which, although *x*-ray examination reveals no great delay in emptying, the patient gives a history of periodic attacks of pain and violent vomiting, often occasioned by some emotional disturbance such as a domestic dispute or a slump on the Stock Exchange. These must be regarded as very early cases of partial gastric obstruction, in which an element of occasional spasm is sufficient to cause temporary obstruction ; they call for particular care, because a violent attack may provoke a dangerous haemorrhage.

It being accepted that surgical treatment is for some reason contraindicated, cases in the classes referred to must be treated with special precautions. Not only must the initial steps of treatment laid down in the first section of this article be prolonged, but when the final diet is approached it must be realized that it is unlikely that the patient will be able to tolerate some of the foods permitted to cases without obstruction. His final diet must contain plenty of fluid and easily liquefied foods. The partially obstructed stomach tends to become overloaded in the later hours of the day, and therefore the more substantial meals should be at breakfast and lunch, and the evening ones correspondingly diminished.

Alkalosis, characterized by headache, nausea, and vomiting, is particularly apt to occur in patients with pyloric stenosis, and so the amount of alkali should be limited to a small one. It is often better to have recourse to some very mild alkali such as simple prepared chalk.

The following is the type of regime often applicable in the final stages of treatment of such cases:

8 a.m.—Belladonna.

9 a.m.—One lightly cooked egg. Two pieces of thin crisp toast with butter and jelly. Two cups of milky tea or coffee.

10 a.m.—A teaspoonful of prepared chalk with water.

11 a.m.—A cup of some milky feed, with a sweet biscuit.

12 noon.—Powder as before.

1 p.m.—Soft fish, minced chicken, or a soufflé. A small helping of well-mashed milky potato. Milk pudding, junket, baked custard, or ice-cream.

2.30 p.m.—Powder.

4 p.m.—Tea, with sponge cake.

6 p.m.—Powder.

7.30 p.m.—A bowl of milky soup with crisp thin toast ; or two poached or scrambled eggs ; or steamed plaice with one slice of crisp toast and a glass of milk.

9 p.m.—Powder.

10 p.m.—A cup of some hot milky feed.

Many patients with a considerable degree of pyloric stenosis have been kept in good health for years on a regime such as this. The older the patient and the more sedentary his habits the more likely are good results to attend such treatment, but I have seen it successful many times, and even in some instances among labourers of the poorest class. It is clear that most careful education of the patient is necessary if such success is to be obtained ; the exact condition of his stomach must be made clear, and the grave risks of perforation and haemorrhage impressed upon him. When this has been done, and he realizes that the treatment is a difficult alternative to surgical operation, he will often collaborate in a most satisfactory manner ; without such intelligent and willing collaboration failure is almost certain to follow.

Deep Ulceration and Adherence to Neighbouring Structures

This is perhaps the commonest class of case in which surgery is the more desirable type of treatment, but it must be recognized that the operation is usually a very serious one, and that the low mortality achieved by the great gastric surgeons is a tribute to their personal skill and in no way suggests that the operation is of minor character. The resection of a considerable portion of the stomach is the most usual treatment, and many patients are encountered who prefer to face the very possible failure of medical treatment over a long period rather than to risk an operation. In justice to himself the practitioner must explain the situation very carefully to the patient, after which medical treatment should proceed either on the lines laid down in the first section of this paper or by means of duodenal feeding. If the usual method of oral feeds and alkalis is adopted all food must be kept fluid for at least a month, although the size of the feeds, there being no gastric obstruction, must be sufficient to secure a diet of a total calorie value of 2,000 a day. Duodenal feeding has achieved some brilliant successes in cases of this type, and presents little difficulty when carried out in a nursing home or institution. The majority of patients do not find it unpleasant after the first few days.

When this line of treatment is adopted careful *x*-ray examination should be carried out once a month, in order that the condition of the ulcer may be noted, and if

healing appears to be in progress treatment must still be continued for a long time, in view of the very chronic nature of such lesions.

Suspected Malignancy

Patients are not infrequently seen with symptoms suggestive of peptic ulceration, but with a history so short that the suspicion of malignancy arises. When, in such cases, the radiologist finds a large ulcer of somewhat atypical appearance this suspicion is often increased. It now becomes a most difficult matter to decide on the right lines of treatment; should the ulcer be a malignant one the only possibility of saving the patient's life lies in surgical intervention, whilst if the ulcer is non-malignant it will probably heal with effective medical treatment, and the patient will then be left in a better position than if an extensive resection of the stomach has been performed. The treatment adopted will depend largely on the personal feelings of the patient and his immediate medical adviser. Obviously a mere whisper of the word "cancer" will be sufficient to make the patient turn towards surgery, and this makes the decision even more difficult. In view of the very bad prognosis which still attaches to all examples of cancer of the stomach there is perhaps sound reason to argue: "If this patient has cancer the chances of cure are remote, if he has a simple ulcer the chances of cure by purely medical means are excellent." Those to whom this argument appeals will accordingly adopt medical treatment on the lines laid down above. This is not the place to discuss this problem further, but it should be added that the decision must be faced and made firmly, in one direction or the other, and acted on without delay.

Other Difficult Cases

It has been said that surgery should be adopted in all cases which continue to relapse in spite of efficient medical treatment. Such cases, unless attended by one of the complications dealt with above, are rare. In my experience I seldom encounter a case of simple gastric or duodenal ulcer, even when the history goes back for ten or fifteen years, in which the medical treatment previously adopted has been such that I should have expected it to cure the patient and prevent relapse. It is particularly the prevention of relapse that is neglected, and this can only be done when the practitioner in charge arranges for the periodic revision of each case, in order to see that gross foci of sepsis are avoided and that the patient's dietetic routine, when at work, is sensible in character. It is only when this has been carried out, and it can be shown that the patient relapses in spite of reasonable care on his own part and in spite of wise guidance by his medical attendant, that uncomplicated cases of peptic ulcer should be treated surgically rather than medically.

A NEW GERMAN LIFE TABLE

[FROM A MEDICAL CORRESPONDENT IN BERLIN]

The life table for the German Reich prepared in connexion with the census of June 16th, 1933,[1] raises many interesting questions. The previous life table was based on the mortality experience of three years, 1924–6, the new table upon the mortality of 1933 only. Apart from the advantage of more speedy publication, the reason for using only a single year's mortality was that in 1933, for the first time, deaths at ages for the whole Reich could be distributed into administrative districts of different population sizes, so that separate life tables for different types of administrative district could be calculated, as was done for England and Wales in 1920–2.

Although therefore the life tables of 1924–6 and 1933 are not strictly comparable, it may be noted that the expectation of life at birth has increased for males from 56 years to 59.8 in 1933 and for females from 58.8 years to 62.6. The English national tables for 1930–2 have not yet been published, but will probably not show quite such large values.

Death Rates at Different Ages

A further technical advantage of the new tables is that for the large majority of the population births and deaths have been allocated to the normal place of residence of the mother or of the deceased person. Tables have been constructed for the whole population, for inhabitants of districts with less than 2,000 inhabitants, for inhabitants of districts with population from 2,000 to 100,000, and for inhabitants of districts with more than 100,000 population—that is, roughly, rural districts, towns of moderate size, and large towns. Taking the whole population, rates of mortality have improved between 1924–6 and 1933 in all age groups except 5 to 9 and over 80 years. In childhood and at ages 20 to 24 the improvement is very striking. For instance, the probability of dying in the first year of life has fallen from 0.115 to 0.085 for males and from 0.094 to 0.068 in females. These are possibly still a little higher than contemporaneous English rates, but the rates at pre-school ages may prove superior to the English figures.

[1] *Neue Beiträge zum deutschen Bevölkerungsproblem.* Berlin, 1935. Sonderheft 15 zu *Wirtschaft und Statistik.*

At every age the mortality of females is less than that of males, even in the second half of the child-bearing period—namely, in the age groups 30 to 35 and 35 to 40, in which the 1924–6 life table still showed a higher rate for females.

Mean Probabilities of Dying (q_x) Multiplied by 1,000

Year of Age	Males			Females		
	1933	1924–6	% Ratio	1933	1924–6	% Ratio
0	84.99	115.38	74	67.66	93.92	72
1	9.33	16.19	58	8.16	14.93	55
2	4.45	6.36	70	4.10	5.74	71
3	3.40	4.04	84	2.80	3.62	77
4	2.76	3.16	87	2.40	2.86	84
5–9	1.88	1.83	103	1.70	1.63	104
10–14	1.23	1.42	87	1.09	1.32	83
15–19	2.08	2.86	73	1.73	2.47	70
20–24	2.81	4.46	63	2.45	3.60	68
25–29	3.09	4.22	73	2.84	4.02	71
30–34	3.53	4.09	86	3.20	4.27	75
35–39	4.30	4.65	92	3.90	4.82	81
40–44	5.60	6.05	93	4.70	5.67	83
45–49	7.79	8.31	94	6.59	7.30	90
50–54	11.45	12.08	95	9.46	10.23	92
55–59	17.04	18.43	92	13.89	15.14	92
60–64	26.19	28.39	92	21.86	23.87	92
65–69	41.75	44.84	93	36.00	39.04	92
70–74	67.25	70.94	95	61.26	63.52	96
75–79	109.42	111.33	98	100.73	103.35	97
80–84	175.27	168.64	104	158.95	157.18	101
85–89	249.27	241.30	103	235.80	223.80	105

The summarizing table here given, as except for the earliest ages it sets out the rates for quinquennia, does not bring out a peculiarity in the course of mortality to which

attention was recently drawn by W. J. Martin, working in Professor Greenwood's laboratory.[2]

This is the decline in the rate of mortality of males between the ages of 20 and 35, a feature observed before in German and French experience, but in England for the first time in recent years (1930–2). A principal factor would seem to be the mortality from accidents among younger male adults. This inflexion of the curve was well marked in the German table for 1924–6. It will be seen that at 20 to 25 the male rate of mortality was 4.46 per 1,000 (1,000 times the probability of dying), at 25 to 30 4.22, and at 30 to 35 only 4.09. Only after this age did mortality increase steadily with age. The inflexion of the curve is less distinct in 1933; indeed, does not appear in a five-yearly grouping. It is, however, present when the probabilities of dying for single years are considered, between the ages of 22 and 24. The Reich's statistical department accounts for this by the fact that in 1924–6 the age group 20 to 25 had a well-defined maximum on the curve of mortality because until 1931 deaths of prisoners of war and missing were included in the deaths. "With the removal from the mortality statistics of delayed notifications of war deaths, the great variations of probabilities of dying between the ages of 15 and 40 which were still evident in the life table for 1924–6 are not found in the 1933 life table." This is also a reason for the great decline in mortality at these ages, a decline which is actually greater than in females—37 per cent. against 32 per cent. With this exception the mortality of women has declined faster than that of men. The exceptions to the rule of improvement relate, as has been noted, to the age group 5 to 10 and ages over 80. For the latter the influenza epidemic of 1933 is responsible; for the former the return of diphtheria may be invoked. "In 1924–6 for every 10,000 children aged 5 to 10 there was only one, in 1933 there were four deaths from diphtheria." In consequence of the decline in rates of mortality, the expectation of life at birth has increased by as much as 3.8 years, and the German figures are now among the most favourable recorded.

The following table gives the expectations of life at birth derived from recent published reports with the exception of England and Wales. The figures for England and Wales are based upon the mortality of 1933 and derived by Dr. E. C. Snow's approximate method. The official tables which will shortly be published are based on the mortality of three years, 1930–2.

Expectations of Life (in Years) at Birth

Mortality Experience	Country	Males	Females
926-30	Denmark	60.9	62.6
1926-30	Sweden	61.2	63.3
1921/2-1930/1	Norway	61.0	63.8
1921-30	Finland	50.7	55.1
1930-33	Austria	54.5	58.5
1921-30	Holland	61.9	63.5
1930-32	Scotland	56.0	59.5
1930-32	Italy	53.8	56.0
1933	Germany	59 8	62.6
1933	England and Wales	58.7	62.6
1924-30	Bohemia and Mähren-Schlesien	52.5	56.1
1925-27	Union of South Africa (Europeans)	57.8	61.5

[2] The Decrease in Mortality during Early Adult Life in England and Wales, *Journ. of Hyg.*, 1933, xxxv, 375.

PAN-AFRICAN HEALTH CONFERENCE

[FROM OUR CORRESPONDENT IN PRETORIA]

The second conference of health representatives of African States under the auspices of the Health Committee of the League of Nations took place in Johannesburg in November. The previous conference, which was held in Capetown in 1932, dealt with a number of matters such as yellow fever, plague, small-pox, leprosy, rural hygiene, dengue fever, and the transmission of diseases other than yellow fever by aircraft. On almost every one of these subjects, especially on yellow fever, further information or new developments calling for action by public health authorities seemed likely to need attention in the near future. For this reason, and because of the experience afforded by that first conference for personal discussion between responsible officials of neighbouring territories in Africa, the delegates considered it desirable that a similar conference should be convened after an appropriate interval, and that the League of Nations should be invited to take steps not later than 1935 to ascertain the wishes of administrations concerned.

The following countries were represented at the Johannesburg conference: Angola, Basutoland, Bechuanaland, Belgian Congo, Madagascar, Gambia, Gold Coast, Kenya, Mozambique, Nigeria, Northern Rhodesia, Nyasaland, Sierra Leone, Southern Rhodesia, Swaziland, Tanganyika, Uganda, Union of South Africa, and Zanzibar. In addition representatives of the following bodies attended: the Health Committee of the League of Nations, Office International d'Hygiène Publique, and the Rockefeller Foundation, while India sent an observer. The conference was in session from November 20th to 30th inclusive, Sir Edward Thornton being appointed chairman and Dr. P. G. Stock vice-chairman.

In opening the conference the Union Minister of Public Health, Mr. J. H. Hofmeyr, said that he could best illustrate the success of the first conference by stating its direct results as far as the Union was concerned. First of all it was followed by the ratification by the Union of the International Convention for the Sanitary Control of Aerial Navigation and the passing through Parliament of the Aviation Health Act. Secondly, it made possible an agreement concerning the adoption of uniform regulations for the protection against small-pox conveyed by persons entering Southern and East Africa from India, and these regulations had since been promulgated. Thirdly, the draft convention for combating dengue fever was discussed by the conference, and as a result that convention had been ratified by the Union. Fourthly, the information gained at the conference concerning the use in native areas of native health staffs trained in both the curative and preventive sides of public health work was an important factor in leading to the adoption by the Union Government of a scheme for a native health service, and to the institution of a course of training for native medical aids at the South African Native College at Fort Hare.

After discussing the various subjects in plenary session the conference resolved itself into committees on: (1) yellow fever, plague, and malaria; (2) rural hygiene, medical services in Africa, and proposals for the better co-ordination of health services in Africa; and (3) typhus, the typhoid carrier problem in African natives, diseases conveyed by animals to man, and the danger associated with locust poisoning. These committees drafted resolutions, which were then submitted to the full conference for confirmation. On all subjects valuable information was obtained, and the advantage of personal discussion between responsible officials of neighbouring territories was strikingly demonstrated. It was resolved that two types of conference should be convened in future: (1) Pan-African health conferences to be held every fourth year; and (2) group health conferences, also to be held every fourth year.

Yellow Fever

The conference recommended: investigations of the existence of yellow fever by the mouse protection test, accompanied or followed by clinical investigation and histopathological examination conducted in all endemic regions of Africa; that an intensive study of the possibility of the existence of jungle fever should be made in view of the presence of this condition in South America;

that consideration should be given to the training of laboratory workers in yellow fever research and routine investigation, and that provision should be made for laboratory facilities in centres accessible to endemic areas ; that further investigations should be made regarding the distribution and measures to be taken for control of *Aedes aegypti* in endemic and other African territories ; that quarterly reports should be furnished and every first case of yellow fever and its locality should be notified to the Office International d'Hygiène Publique by African Colonial administrations ; that the decisions to suspend or reopen traffic in aerodromes in yellow fever regions should be notified to the Office International, and the personnel of aircraft operating in endemic areas should be protected by vaccination against yellow fever ; that the practicability of mosquito-proofing for aircraft should be investigated ; and that the principle of residential areas reserved for European accommodation in yellow fever endemic areas should be strictly adhered to.

Plague

The conference considered that the best practical policy in towns was to concentrate upon systematic building out of rats, supplementing this by effective rodent destruction and the creation of deep rodent-free belts round boundaries, rather than to rely on measures such as mass prophylactic inoculation. In countries where spread was mainly by wild rodents the setting up and maintenance of barriers by gassing, poisoning, and trapping together with an attack on domestic rodents was recommended ; where the domestic rodent problem was an important factor and defied control prophylactic vaccination might have to be undertaken in addition to such anti-rodent measures. It was also recommended that an organization independent of territorial limitations should be established to conduct investigations into all matters relating to plague, to co-ordinate observations, and to disseminate information to neighbouring States.

Malaria: Typhus

It was proposed that more extensive research should be carried out on the following problems: (*a*) child mortality from malaria in indigenous communities ; (*b*) the extent to which working capacity was interfered with by malaria ; (*c*) the influence of malaria on racial increase ; (*d*) the influence of drug treatment on immunity, and whether there was danger in a primitive community in such treatment ; (*e*) the influence of malaria infection on mental development of African children ; and (*f*) the strains of malaria parasite and the action of various therapeutic substances.

In the opinion of the conference the raising of the economic status of the native population was the only practical way of eradicating endemic typhus. In regard to the typhoid carrier problem further research into vaccines for sterilization of carriers was recommended ; also that improvements in all conditions of milk production and distribution, combined with efficient pasteurization, should be insisted upon in Africa.

Locust Campaign

Further research was recommended with a view to finding a method of destruction of locusts less dangerous to human and animal life than the use of sodium arsenite.

With regard to animal diseases communicable to man, the conference recommended further research into the transmission and eradication of rabies, and the investigation of bovine tuberculosis as a menace to human population in African territories. On hygiene and medical services in rural areas the conference was satisfied that medical and sanitary services would have to be largely provided by African personnel, and noted with gratification the advance made in the training of Africans for subordinate medical, nursing, and sanitary services. It was urged that the health committee of the League of Nations should set up a committee to deal with African health problems, and that the personnel should include medical officers with African medical administrative experience.

VOLUNTARY HOSPITALS COMMISSION

In accordance with a resolution adopted at the annual conference held at Leamington in June, 1935, the council of the British Hospitals Association has appointed a Commission, with the following terms of reference:

> To take into consideration the present position of the voluntary hospitals of the country ; to inquire whether, in view of recent legislative and social developments, it is desirable that any steps should be taken to promote their interests, develop their policy, and safeguard their future ; and to frame such recommendations as may be thought expedient and acceptable.

The Commission is constituted as follows:

Viscount SANKEY, P.C., G.B.E. (*chairman*).

Lord COZENS-HARDY, D.L., chairman, Merseyside Hospitals Council. Was chairman of the Liverpool Hospitals Commission, which reported early in 1935.

Miss H. BARTLEET, O.B.E., J.P., an Alderman of the City of Birmingham and chairman of the House Committee of the Birmingham General Hospital.

Sir HENRY BRACKENBURY, M.D., LL.D., late Chairman of Council of the British Medical Association.

Alderman ALAN DAVIES, J.P., former Mayor of Wolverhampton. Chairman, Wolverhampton Corporation Transport Department, and Wolverhampton Hospital Contributory Scheme.

Professor L. S. DUDGEON, C.M.G., C.B.E., M.D., F.R.C.P., dean of the Medical School, St. Thomas's Hospital. Hon. secretary of the Voluntary Hospitals Committee, County of London.

Mr. H. L. H. HILL, past-president of the Council of the Institute of Chartered Accountants of England and Wales.

Colonel D. J. MACKINTOSH, C.B., M.V.O., M.B., LL.D., medical superintendent, Western Infirmary, Glasgow. Vice-president, British Hospitals Association and past-chairman of council.

Miss E. M. MUSSON, C.B.E., R.R.C., chairman of the General Nursing Council for England and Wales. Former matron of the Birmingham General Hospital.

Sir REGINALD POOLE, K.C.V.O., past-president of the Law Society.

Professor A. W. SHEEN, C.B.E., D.L., M.D., F.R.C.S., director of the Surgical Unit of the Welsh National School of Medicine.

Secretary.—Mr. R. H. P. Orde, honorary secretary of the British Hospitals Association and director of the Central Bureau of Hospital Information.

The Commission held its first meeting at Joint Council House, 12, Grosvenor Crescent, London, S.W., the headquarters of the British Hospitals Association, on January 15th, 1936. It is particularly requested that any person or body desiring to make representations or give evidence should, in the first instance, communicate with the Secretary, Voluntary Hospitals Commission, 12, Grosvenor Crescent, S.W.1.

The twenty-sixth annual report of the Cicely Northcote Trust, which covers the twelve months ended October, 1935, reveals the extent of the medico-social service which has now evolved at St. Thomas's Hospital in close co-operation with medical and nursing staffs. During the period under review an effort has been made to enable patients who are less financially embarrassed to help the poorer ones, and some very good results have been obtained. This is due in great measure to the individual interest which has been stimulated in difficult cases, and numerous examples are cited of the way in which this assistance has been wisely and effectively directed. Training for work, sanatorium and convalescent home treatment, vocational guidance, and the securing of suitable employment are some of the ways in which help has been given. The temporary but very real home provided in the Northcote Trust House for young women and girls in difficulties has been much appreciated. Donations, subscriptions, and grants totalled £1,881 in the year. The expanding nature of this work and its humanitarian character merit an even greater support in the future.

PHYSICAL EDUCATION

THE BOARD'S CIRCULAR TO LOCAL AUTHORITIES

In the leading article printed at page 115, which discusses the Board of Education's circular outlining the Government's administrative programme of educational development, reference is made to a brief paragraph on physical education, which declares that

> Bodily health can only be maintained and improved by systematic physical education, and while organized games play an important part in this, the best means of securing continued physical fitness is by physical exercises in school premises or in the open air.

The Board has now issued to local authorities a further circular,[1] sketching its views on the development of physical education in the schools and among young people generally. The purpose of this is to show that physical education has a special contribution to make to a healthy and enjoyable life and should be further developed, particularly among the young.

> Unless the body is trained to fitness the education of mind and personality is hampered. The need for physical education and games extends beyond the schools to young people generally, and, with our system of decentralization, progress in this sphere of education depends on the enthusiasm and initiative of local authorities and voluntary bodies and on their co-operation

Public Elementary Schools

The circular states that during the past thirty years the scope and quality of physical education has been transformed from a narrow system of school drill into a balanced scheme for the physical development of children throughout their school life. But there are still schools, and even whole districts, where the teaching is dull and lifeless. In this connexion the value of work of organizers of physical training is emphasized. The Board will welcome proposals for the provision of gymnasia in senior schools, and, in the matter of playing fields, it urges authorities to survey the needs of their areas, with a view to supplementing the existing provision wherever practicable.

> There should be a daily period of organized physical activity in every elementary school. The length of these periods, as well as their allocation, will depend somewhat upon circumstances, but an allowance of three periods weekly to physical exercises, one to swimming, and one to organized games will often be found suitable. For girls dancing may on occasion be substituted for games or swimming.
>
> The need for adequate playing fields, especially for the older boys and girls, is generally recognized. Not only have games a well-established part to play in the physical education given in the schools, but unless children learn to play games at school they will probably not have the opportunity later on, and will find themselves deprived of the healthy enjoyment of playing games in their leisure time.

Secondary and Technical Schools

In the secondary schools the need is mainly for trained teachers in the boys' schools and for more time to be given to physical education, which should not be crowded out by the pressure of other subjects. The circular declares that a gymnasium should form part of the normal provision in all secondary schools. In junior technical schools and in technical colleges better accommodation and more qualified teachers are required. Physical education and games constitute a vital part of the corporate life of these institutions.

> Apart from its educational value, experience has demonstrated the contribution which a gymnasium can make to the corporate life of the college. The need of playing fields for students attending technical colleges also calls for increased attention. Hitherto this side of the activities of the college has not generally received the attention it deserves.

Young People No Longer at School

The Board regards it as a matter of national importance that more consideration should be given to the development of facilities for physical training and games among young people who have left school, but "any imitation of the centralized methods in use in some Continental countries would be altogether inappropriate." Each area must build up the organization best fitted to its own local circumstances.

The circular pays a tribute to the work done by authorities and voluntary organizations in helping to maintain the physique of those who are without employment: "The ground is, however, far from completely covered." The Board considers it desirable that local education authorities should devote more attention to this work, and that their organizers of physical training should be available to assist voluntary bodies with advice in organizing the necessary courses.

Organizers of Physical Training

The circular mentions as a matter for regret that only 124 of the 316 local education authorities in England and Wales have yet seen their way to appoint organizers, and the Board urges most strongly that the time has now come when the appointment of a sufficient number of qualified men and women organizers should be regarded as an indispensable part of the provision for physical education made by all authorities. The organizer of physical training should be "the recognized guide and adviser for the community as a whole in matters relating to physical exercises and recreation," and his work should not be limited to schools of any type, but should extend to young people, both employed and unemployed, who have left school. Further, his services should be freely available to voluntary organizations and for co-ordinating their schemes with those of the authority.

Summary of Proposals

The main directions in which the system of physical education in this country calls for improvement and expansion are summarized as follows:

(*a*) A more complete organization of physical education through the appointment in every area of an adequate number of men and women organizers, who can advise teachers in all types of schools and can help to co-ordinate and develop the provision of physical activities for children and young people generally;

(*b*) a larger output of teachers competent to give gymnastic training in senior, secondary, and technical schools, and an increase in the numbers of short courses for teachers in all types of schools, and for leaders in voluntary organizations;

(*c*) an improvement in the standard of physical training in elementary schools, particularly in certain areas;

(*d*) a fuller appreciation of the need for physical education for pupils in secondary and technical schools at all stages of their school life;

(*e*) a more thorough organization to enable young people no longer attending school, whether employed or unemployed, to continue to receive physical education from competent teachers and in suitably equipped premises.

The Board announces its intention to issue in the near future publications dealing with recreation and physical fitness for youths and men and for girls and women respectively, and to publish at an early date a memorandum on the planning, construction, and equipment of gymnasia. The concluding sentence of the circular is as follows:

> The foundations for a complete and efficient system of physical education have been laid; it is now the task of authorities, teachers, and voluntary organizations throughout the country to build upon those foundations a complete structure, which will be of inestimable value in the development of a healthy, happy, and vigorous community.

The Central Council of Recreative Physical Training (11, Doughty Street, London, W.C.1) was formed last summer to co-ordinate the work of voluntary bodies engaged in providing physical education and recreation for those who have left school. On January 13th the council issued a circular which is intended to be complementary to Circular 1445 of the Board of Education, of which a summary appears above. The response to the formation of this national movement, it says, has been universal, and the progress already made leaves no doubt of the vital need for such a voluntary national organization.

[1] Physical Education. Circular 1445. H.M. Stationery Office. 1936. (2d. net.)

Scotland

Dispensary Services of Glasgow

Dr. A. K. Chalmers, formerly medical officer of health for Glasgow, has recently published a report on the scope of the dispensary system of Glasgow with some details of a suggested revision to avoid overlapping. He states that there would seem to be sixteen separate dispensaries in the city, three being attached to the Royal, Western, and Victoria Infirmaries. In thirteen of these for which statistics for 1934 are available, 311,508 new cases were seen during those twelve months, and the attendances totalled 1,068,817. Dr. Chalmers points out that, even allowing for possible corrections on the score of duplication of records, there must be an average weekly attendance of 6,000 new cases, and the total weekly attendances must approximate 20,500. He expresses his belief that the modern scientific advances in the promotion of health and the prevention of disease will only be fully fruitful when they are applied through an integrated clinical service, and that consequently some recasting of the dispensary system is required. Much of the dispensary work is supplementary to that of the family doctor, both for diagnostic and for therapeutic purposes, but some of it would appear to be a substitute for it and for the work of the consultant, and this must ultimately tend to impair the standard of clinical efficiency which intimate association with disease in all its stages alone can secure. Dr. Chalmers refers to the warning uttered last summer by Professor James Hendry as to the economic crisis which is crippling the younger consultants through the indiscriminate admission to hospitals of patients on a non-paying basis. He also cites the warning of Sir Charles Loch twenty years ago that the adoption of gratuitous medical treatment could not fail to weaken social ability and injure character. In the case of hospitals the installation of almoners had modified the situation, but Dr. Chalmers thinks it likely that a considerable proportion of the 300,000 who day by day flood the dispensaries are being withdrawn from general practice, either panel or private, and that this matter is not yet receiving the careful study it deserves. Next, he considers that dispensaries, and especially those associated with hospitals, might well promote better general medical efficiency by being developed into clinical centres or exchanges, to which local medical practitioners could have ready access and so become acquainted with the advances in diagnosis and therapy. He recalls Dr. Hawthorne's suggestion that the dispensary might indeed become a post-graduate school in continuous session. Dr. Chalmers considers that the first step in such reorganization lies in a scrutiny of the dispensary clientele and a determination of the numbers entitled to medical attendance under the National Health Insurance Act, of the number of dependants on insured persons, of those entitled to medical services from the public assistance authority, and, most important of all, of those whose clinical histories have been attested by their panel doctors. In 1934, he states, little short of 427,000 persons were registered as entitled to medical benefit, and 167,000 as entitled to medical services under the public assistance authority; these together amount to 37,000 more than half the population of Glasgow. If to these figures is added four-fifths of the dispensary clientele a total of 834,000 is reached, which represents 75 per cent. of the population of the city. Dr. Chalmers asks whether it is credible that this figure can have been built up without the occurrence of a considerable volume of overlapping, and he doubts whether there is yet an appreciation of the present magnitude of the dispensary services of Glasgow or of their rapid growth in recent years.

Royal Infirmary of Edinburgh

The report presented to the annual meeting on January 6th of the Court of Contributors to the Royal Infirmary of Edinburgh, when Sir Thomas Whitson, chairman of the Board of Managers, presided, showed that the total ordinary expenditure for the year had been £156,698 and the ordinary income £128,649. In addition there had been an extraordinary expenditure of £27,000 in payment of new buildings. The deficit had been met out of legacies received during the year amounting to £75,000. The chairman pointed out that although there had been no necessity to trench on invested funds, the financial position was not quite stable until a much larger ordinary income was available. The budget for the coming year was almost identical with the previous year's figures. He wished the public to distinguish clearly between the appeal for a sum of £500,000 for the taking over of the Royal Maternity Hospital and the appeal for increased annual support. In view of the expenditure on various extensions and new buildings an additional £60,000 per annum would be required. The report also showed that satisfactory progress was being made with the work of erection of the new block to be used for a dermatological and venereal department, which, it is hoped, will be opened early in 1936. Progress has been made, too, with the new maternity block and nurses' home. A new boiler house and mortuary are under construction at an estimated cost of £22,000. The existing *x*-ray apparatus, which was installed in 1926 and was then recognized as one of the most up to date in the country, has required considerable addition; an expenditure of £10,000 has been sanctioned for new apparatus for deep *x*-ray therapy, to be used especially for the treatment of cancer cases. The number of patients treated during the year was 20,695 as compared with 19,849 in the previous year, and the daily average number of patients in hospital was 936.45. Persons admitted to hospital as the result of motor accidents numbered 366, which was sixty-eight less than in the previous year, while those treated in the surgical out-patient department numbered 531, or sixty-nine less than in the previous year. Under the Road Traffic Acts the Infirmary received £1,353 for the maintenance of these patients. The actual cost to the Infirmary, however, was £2,618.

Ireland

The late Dr. Hennessy

At a meeting of the Dublin Dispensary Doctors Association the following resolution was carried, all members standing: "That we deplore the sad and unexpected demise of Dr. T. Hennessy, Irish Secretary of the British Medical Association, the dispensary doctor's friend and counseller, and we tender to his relatives our deepest sympathy in their great sorrow."

Forthcoming Congress of Obstetrics and Gynaecology at Belfast

The tenth British Congress of Obstetrics and Gynaecology will be held at Belfast from April 1st to 3rd, under the presidency of Professor R. J. Johnstone. The meetings will take place in the Physics Lecture Theatre, Queen's University, and the Pathological Institute at the Royal Victoria Hospital. The morning session of the first day will be devoted to a discussion of the conservative treatment, operative or otherwise, of pathological conditions of the ovaries, tubes, and uterus, with special reference to functional results. Professor J. Hendry will speak on the results of conservative treatment of the ovaries, Dr. Bethel Solomons on that of the tubes, and Professor Leyland Robinson on that of the uterus. In the afternoon papers will be read on myomectomy by Mr. A. A. Gemmell, F.R.C.S., on the treatment of endocervicitis by Dr. S. Herd, and on conservative therapeusis in gynaecology by Dr. De-Sa. At 5 p.m. there will be a meeting of the Council of the British College of Obstetricians and Gynaecologists, under the chairmanship of Sir Ewen Maclean, and at 9 p.m. the president and Mrs. Johnstone will entertain the congress members and their friends at a reception in the Great Hall of the University. Four communications will be received at the morning session on April 2nd. Dr. James Heyman of Stockholm will report on the Radiumhemmet method, treatment, and

results of cancer of the body of the uterus; Professor Gilbert Strachan will deal with the subject of carcinoma development after radium; Dr. P. Malpas will discuss the place of radium in the treatment of non-malignant uterine lesions; and Dr. L. Martindale will consider the treatment of uterine haemorrhage in non-malignant disease, with reference to irradiation by radium or x rays. The members will then be entertained to lunch by the University in the dining hall of the Students' Union. At the afternoon session communications will be received from Dr. George Gray Ward of New York on reconstructive pelvic surgery for prolapse; from Dr. Kaufmann on clinical uses of the female sex hormones; and from Mr. T. N. A. Jeffcoate, F.R.C.S., on organotherapy for functional uterine haemorrhage. Cinematograph demonstrations will be given by Professor Blair-Bell and Mr. Datnow on primary malignant disease of the vulva, with special reference to operative treatment, and by Dr. MacConnaill on the development of the female genital organs. At 5 p.m. will be held the annual meeting of the British College of Obstetricians and Gynaecologists, and at 7.45 p.m. the congress dinner in the Grand Central Hotel. Communications at the morning session on April 3rd will include one from Dr. Colebrook on the prevention of puerperal sepsis, one from Dr. H. R. MacLennon on contracted pelvis in Scotland, and one from Dr. G. W. Theobald on the relationship between pregnancy and chronic nephritis. Further information may be obtained from Mr. C. H. G. Macafee, F.R.C.S., joint secretary of the congress, 18, University Square, Belfast.

Medical Benevolence

At a meeting of the committee of the Belfast and County Antrim Branch of the Royal Medical Benevolent Fund Society of Ireland, held in the Whitla Medical Institute, Belfast, on January 8th, Dr. J. S. Morrow, chairman of the branch, presiding, a resolution was passed unanimously conveying the best thanks of the branch to Dr. V. G. L. Fielden for his invaluable services as honorary secretary and treasurer for the past twenty-eight years. Dr. Fielden's resignation was accepted with regret, and Dr. Robert Marshall was appointed as his successor. Future subscriptions should be forwarded to Dr. Marshall at 9, College Gardens, Belfast.

Problems of Population

Dr. Frank Kane, president of the Medical Society of University College, Dublin, in a paper on the growth of populations, said that England was now on the verge of a population scare—a lament for her lost people. Ireland, too, was on the brink of another population scare—a worry about what to do with her growing people. Referring to a table of statistics of the marriage rate in Ireland, he said it would be seen that they were in the position of being at the wrong end of both columns. There were too few marriages and a tremendous number of children per marriage. That absurd condition could not remain indefinitely. They must expect that an increase of the marriage rate would raise the birth rate from the present low average. Any such change would have remarkable effects on the uprise of the population of Ireland, and might well send the country back to the figures of her pre-famine population. Mr. Seán T. O'Kelly, Minister of Local Government and Public Health, proposing a vote of thanks to Dr. Kane, said that the problem of population was of special interest owing to the distribution and composition of the population and the conjugal condition of the people of Ireland. In 1936 a census of the population in the Free State would be taken, and it would be interesting to see the changes that had taken place since the census in 1926. Of particular importance would be the comparison of the percentage of the population in the different age groups, or what might be termed the structure of the population. He did not agree that war, migration, and epidemics had no great effect on a country's population. Surely the great exodus from Ireland from 1847 to 1854 had more than an appreciable effect on the population; and the many millions that swarmed into the U.S.A. from Ireland and other countries must have had an appreciable effect on that country's population. It did not seem to be quite true that in Ireland the expectation of life in women was greater than the expectation of life in men.

In a recent paper to the Statistical and Social Inquiry Society of Ireland, Mr. R. Geary said that the statistical investigation into the trend in the birth rate showed that the decline from 28 per 1,000 population in the 1870's to about 19 at the present time was due to the fall in the marriage rate and to the increased age at marriage of females. The marriage rate in the Free State was the lowest in the world, whilst the fertility rate (births per marriage) was one of the highest. An investigation, based on data for twenty-eight countries, into birth, marriage, and fertility rates revealed the remarkable fact that there was no significant relation between birth rate and marriage rate, and—what came to the same thing—that there was an inverse relation between marriage rate and fertility rate.

England and Wales

Atmospheric Conditions in Thames Tunnels

Systematic investigations into the condition of the air in the Blackwall tunnel have shown a considerable increase in the average carbon monoxide content of the air samples; the average figure at the last analysis, the observations being concentrated mainly on busy periods in the morning, was 20.6 parts in 100,000. This is attributed to the continued increase of traffic through the tunnel and the consequent slowing down of the average speed. The conditions in Rotherhithe tunnel were better, though the limit of 20 parts of carbon monoxide was twice greatly exceeded. The fog shade figures show on an increasing number of occasions a certain amount of fog in the tunnel when the outside air is not hazy. The further improvement of ventilation at Blackwall tunnel is being considered by the London County Council. The air in Rotherhithe tunnel is still good enough with the present ventilation, but at the current rate of increase in mechanically propelled traffic action here may soon be necessary. Blackwall tunnel was constructed in 1897, and is 1 mile 270 yards in length. Rotherhithe tunnel was constructed in 1908, and is some 60 yards longer.

A Survey of District Nursing

A survey of district nursing in England and Wales has been made by the Queen's Institute of District Nursing.[1] In fifty-one counties and 135 cities and towns nurses work under district nursing associations which are affiliated to the institute, and thus a definite standard of training and supervision is maintained. Two classes of nurses are employed: Queen's nurses proper and village nurse-midwives—that is, certified midwives with some training in district nursing. During 1934 68,519 midwifery cases were attended by 1,019 Queen's nurses and 3,068 nurse-midwives. The maternal mortality rate was 2.74 per 1,000, and for the previous ten years 1.91 per 1,000. A rough estimate of how far the population of England and Wales had been provided with a district nursing service was made in 1926, when it was found that on the basis of one nurse to 10,000 of the population nursing was provided for about 75 per cent. of the people. Since that time there has been an increasing demand for trained home nursing care on the part of the medical profession, the local authorities, and the people themselves. The survey now presented is based on the proportion of one nurse per 3,000 population where ordinary nursing duties are combined with public health duties, such as health visiting and school nursing; one nurse per 5,000 to 6,000 population where midwifery is combined with general nursing; and one nurse per 7,000 to 9,000 population if undertaking

[1] 37, Lower Belgrave Street, S.W.1. (2s. 6d.)

general nursing only. On this basis a number of counties are adequately covered, and in others the service is extending. A nursing service is reckoned to be available for 96 per cent. of the population of England and 85 per cent. of the population of Wales, but, of course, the provision is not equally distributed, and in many populous centres an extension is required. In order to complete the service 780 more nurses are needed in the county boroughs and 845 in the administrative counties. Much useful information is to be derived from the tables as to local provisions and needs. In six English counties the average population per nurse is below 2,000; in London and Middlesex it is above 12,000. There are great variations in the numbers needed to complete the service in different areas. Lancashire with its county boroughs requires 184 nurses to come up to standard, but Leicestershire only requires nine; London needs 211, but Essex only two. Among metropolitan boroughs the area in greatest need of nurses, after counting in all the associations serving the borough, is Islington, which needs twenty-six, followed by Wandsworth, needing eighteen.

Central Midwives Board

At the January meeting of the Central Midwives Board for England and Wales it was announced that the Minister of Health had approved the appointment of Mr. Leslie Farrer Brown as secretary of the Board, subject to the Minister being informed of the date on which Mr. Farrer Brown would take up his duties. In reply to a letter from the county medical officer of health for Dorset the Board stated that, in accordance with its rules, a midwife was bound to use the books and forms prescribed by the rules, and it could not sanction any variation. Approval as lecturer was granted to Miss Sheila Thomson, M.B., Ch.B., York Maternity Hospital; Miss Beatrice Marion Willmott, M.B., F.R.C.S., was appointed an examiner at the Birmingham centre. It was resolved that the Board would not consider applications for an increase in the number of pupil midwives to be trained in an institution until the new training and examination rules had been approved.

Reports of Societies

MODERN METHODS OF DIAGNOSIS BY AGGLUTINATION

At a meeting of the Section of Tropical Diseases and Parasitology of the Royal Society of Medicine on January 9th, with Dr. P. H. MANSON-BAHR presiding, Dr. J. C. CRUICKSHANK, of the bacteriological department of the London School of Hygiene and Tropical Medicine, discussed modern work on agglutination.

Dr. Cruickshank said that the main uses of the agglutination reaction were to study the antibody content of the patient's serum and to attempt to identify an unknown organism which had been isolated. There were two stages of agglutination: in the first the antibody combined specifically with antigen, and in the second the organisms thus sensitized clumped under the action of the solution in which they were suspended. He touched on the older methods of agglutination, including slide-agglutination, which was still used for certain purposes, such as the typing of pneumococci and for getting a primary orientation for the subsequent use of more exact methods in dealing with Salmonellas. Such methods gave some idea of the antibody content of a serum, but were not capable of the accuracy and refinement of the macroscopic technique now followed. He also explained Dreyer's interpolation tables, in which values were assigned to various degrees of agglutination in relation to a standard suspension—namely, an agglutination clearly visible to the naked eye, though without sedimentation. It had further to be considered how different parts of the bacterial cell entered into the agglutination reaction; and here he described the flagellar and somatic components of the antigenic structure of the Salmonellas, the one form being called *Hauch*, and the other, the non-flagellar antigen, *ohne Hauch*, designations which were shortened to "H" and "O" respectively. The "H" agglutination took the form of loose, woolly floccules settling down as sediment to the bottom of the tube, while the "O" flocculated in the form of dried granules, which formed a sandy, compact sediment. The "H" antigen was quickly destroyed by heat, the other would survive even boiling. In addition to type and group phase variation of Salmonellas, rough and smooth variation had to be considered. The ordinary colony of the Salmonella group was round with a smooth surface, but there were variants. The smooth "O" antigen was the important one immunologically, and the rough organism had lost its virulence. In serological work with Salmonella it was important to ensure smooth strains.

The Diagnosis of Enteric Fever

Turning to the diagnosis of enteric fever, Dr. Cruickshank said that it was necessary to carry out certain quantitive tests. The significance of "O" agglutinins must not be disregarded; certain enteric cases produced no "H" agglutinins. The proportion of such cases was variable, but there were quite a number on record. The zone phenomenon must also be borne in mind. By this was meant the inhibition of agglutination sometimes observed in a series in which the serum was least diluted, so that it happened that a single comparatively strong dilution of serum might give a negative result which would have been recorded as a positive if a series of higher dilutions had been taken. "H" agglutination for *B. typhosus* might be expected at a titre of 1 in 20 in about 4.7 per cent. of the uninoculated population; in the inoculated the "H" titres would be very much higher, and diagnostic significance should not be given to a titre of less than 1 in 200. The corresponding information with regard to "O" agglutinins was less clear. Undoubtedly some "O" agglutinins were produced in response to inoculation, but they rapidly fell to a low level. In a case of enteric fever the agglutinins began to rise at the end of the first week, and reached a peak between the eighteenth and twenty-first day, then falling, at first rapidly, and afterwards more slowly, being detectable for a considerable period during convalescence. As to the chance of finding agglutinins in a series of cases at any stage of the disease, agglutinins might be expected in about 20 per cent. of cases at the end of the first week, rising to over 80 per cent. in the third and fourth weeks. An important point to bear in mind, however, was that somatic agglutinins in enteric disease were not so specific as might be expected on studying the antigenic relations of the organisms concerned. One further aid to diagnosis was afforded by repeating the tests at a later date. It was frequently said that it was of no use doing a Widal test in the first week. Certainly a negative or doubtful result might be forthcoming, but a useful base-line would be afforded, so that the result of another test at a later date could be more advantageously studied. If, for example, there had been a tenfold rise in titre there would be a strong presumption of infection, but in an inoculated person it must always be remembered that there might be a similar rise in titre for the other organisms in the vaccine. There was also evidence to show that a non-specific rise of this sort—the anamnestic rise, as it was called—might take place on infection with other febrile conditions, such as typhus. In any particular country certain data ought to be available to the immunologist, and a knowledge of organisms likely to cause infection in that locality would simplify the tests. It would not be necessary as a routine to test sera against a large array of suspensions, but only to take, in the first instance, a few common infections in the district. He gave examples of Widal findings where "H" and "O" suspensions of *typhosus*, *paratyphosus* A and B, and a Salmonella group were used, to illustrate active typhoid infection in patients with and without normal agglutinins.

The "Vi" Antigen

A great deal had lately been written on the "Vi" antigen, described by Felix, and its relation to agglutination. This additional antigen appeared to be a sort of sheath antigen, enclosing the body of the organism, and such organisms (of typhoid) were more virulent to mice than ordinary strains. The "Vi" antigen might be inferred from the "O" inagglutinability of a strain, a phenomenon which usually disappeared after a series of cultures, the "Vi" antigen being lost. He thought it lacked value in diagnosis by the Widal test in cases, but perhaps had a value in carriers. The speaker also gave a very brief outline of antigenic structure in relation to diagnosis of Shiga and Flexner dysentery, and pointed out certain difficulties in the assessment of Widal findings owing to cross-reactions of the serum of Shiga cases with *B. flexneri*, and the high normal level of Flexner agglutinins. Finally he touched on Brucella infections. The roughness or smoothness in Brucella was a factor to which attention must be drawn. It was important that serological work should be carried out with smooth strains. One of the best methods of testing these organisms for roughness was by the thermo-agglutination test. With regard to antigenic structure the relation of the two main Brucella types, *Br. melitensis* and *Br. abortus*, had to be considered. What was the major antigen in the one type was the minor in the other, so that if an antiserum were prepared against one or other of them it would not help much in deciding whether any unknown organism which must be tested for agglutination was *Br. melitensis* or *Br. abortus*. He described a method by which a mono-specific serum could be obtained and used as a means of identifying the unknown organism. In demonstrating the Brucella agglutinations in the serum of patients it was important to run up an adequate series of dilutions, and again it was important to have local knowledge of the common types of infection. In the normal population it might be expected that about 2 per cent. would have agglutinins for Brucella in a titre of 1 in 40; persons such as butchers, farmyard workers, and veterinarians were much more likely to have agglutinins of a higher titre, but owing to their contact with animals these were the very persons in whom the possibility of Brucella infection was most likely to be considered. It was important to keep occupation and environment in mind before committing oneself to diagnosis.

General Discussion

Dr. MANSON-BAHR said that it must not be thought that clinicians did not take an interest in agglutination. The great question for them was to agglutinate or not to agglutinate. He spoke as one who had been through an epidemic of typhoid and paratyphoid B in Gallipoli, and, working with Sir Charles Martin, he had appreciated the difficulties that arose in the diagnosis of paratyphoid B in people who had been previously inoculated. In later years he had come across a good many cases of Brucella infection, but although Dr. Cruickshank had spoken of the particular liability of farmers and butchers, he himself had come across *Br. abortus* infection with considerable frequency among people who certainly had nothing to do with the farming or dairying industry, and were not remarkable for drinking milk. It was an infection found often among society people, and he wondered whether it had anything to do with horses.

Dr. A. FELIX, of the Lister Institute, mentioned two controversial points: one, the non-specificity of the "O" antigen in the Salmonella groups; and the other, the specific or non-specific re-stimulation of agglutinins previously produced in a patient. The overlap in the "O" antigen was sufficient often to make it impossible on the ground of the presence of antibody alone in the patient's serum to type the infective organism. He still subscribed to the view that on pure "O" agglutination in a patient's serum one could not tell the infection with *typhosus*; one could only say with certainty that it was of the enteric group. On the second point he thought that the reason why opinions were so divided was that it required severe disease, a prolonged febrile condition, to re-stimulate non-specifically the previously actively acquired antibodies.

Dr. PETER MARTIN spoke of experiences on the anamnestic reaction in fevers such as typhus. At the end of the first week for the first specimen of blood there were positive enteric "O" agglutinations of doubtful significance, but on asking for a second specimen about a week later it was found in quite a fair number of cases that the enteric "O" agglutination had fallen to half of what it had been before. The anamnestic reaction was most commonly seen with the "H" agglutinations rather later in the disease, perhaps the second week, but he wondered whether there was not a similar rise of "O" agglutinations of which he had only detected the subsequent fall during the second or third week. Group-Captain H. E. WHITTINGHAM, R.A.F., said that in a certain number of cases "O" agglutinations were found about a month after protective inoculation. So far as he could see there was very little parallelism between agglutination and immunity, and that was confirmed by mice experiments. His experience with abortus fever was that most of the cases were in men over the age of 35; they occurred occasionally in women, and there were very few in children.

Dr. BRUCE WHITE considered that the agglutination problem had completed a certain stage, and it was time to think about moving on to the next. Terms like "H" and "O," and this new "placebo" of Felix in the form of "Vi," were very comforting, but the method, with all the purifications introduced, remained a blunderbuss. An organism was still used which contained a multiplicity of reacting substances. The best of their reactions were multiple. The next stage would bring in a purified antigen. Professor A. FLEMING said, on one point of technique, that if it was desired to carry out agglutination with any of the organisms that agglutinated slowly it was not necessary to wait a long time, or to give them four hours in the incubator. They could be given a short time and then centrifuged, and a good result was forthcoming with a clear end-point.

Colonel F. P. MACKIE asked whether anybody in London had obtained reliable results with agglutination in the diagnosis of dysenteries. He had had some experience in the Tropics, and had found agglutination a fairly good guide to the infection, but the Flexner infections were much more complicated, and the permutations and combinations of this group of organisms made it very difficult to come to a decision as to which organism was likely to be causative. Must the organism be in the blood to produce antibodies? He added that he would not give a positive diagnosis in Shiga with a titre of under 1 in 50, nor in Flexner with one under 1 in 200. The lecturer had spoken of the application of agglutination to vibrios, but the agglutinating properties of the cholera vibrio were profoundly altered by the action of dissociating agents, particularly bacteriophage. The problem in cholera was by no means simple. Dr. LOVELL, as a veterinarian, said that it might interest the Section to learn how widespread was the Dublin type of Salmonella infection among calves. It had been found in this country and in Denmark, also in Kenya, and it was possibly highly infective for calves in America. He also spoke of the difficulties of agglutination as applied to animal serum. He had tested a large number of sera from healthy pigs, cattle, sheep, and horses, and found all of them, after the animal was three or four months of age, to possess agglutination both in "H" and "O" suspensions of the Salmonella in relatively high titres. Dr. H. H. SCOTT mentioned the absence of agglutination up to a late stage in the disease; also the fact that where the agglutination had been low and the patient had a haemorrhage the agglutination titre immediately afterwards ran up very high.

Dr. CRUICKSHANK, answering one point made by Colonel Mackie, said that experiments on the lines of injecting antigen and removing the spleen, in an attempt to find out what was the site of formation of antibodies, pointed to the formation of antibodies actually in those cells which made up the reticulo-endothelial system, such as spleen, bone marrow, and liver.

ENUCLEATION OF PLEURAL ADHESIONS

At the December meeting of the Section of Surgery of the Royal Academy of Medicine in Ireland Mr. A. B. CLERY read a paper on the enucleation of pleural adhesions by open operation. This operation, he said, was particularly indicated in patients with one or two apical adhesions extending into the region of the subclavian vessels. The skin incision was as for an upper thoracoplasty, the deeper muscles being divided in the line of the third rib. Having retracted the scapula, two and one-third to three inches of the rib were resected, and the pleura was opened by diathermy. Light-bearing retractors were introduced into the pleural cavity, and the adhesions were enucleated from their attachment to the parietal pleura by the diathermy needle under direct vision.

Dr. G. T. O'BRIEN described the clinical course of three patients subjected to this operation, and demonstrated their progress by *x*-ray films. In two patients the sputum, previously positive, was negative to tubercle bacilli within a fortnight of the operation, and cavities had closed in six weeks. In the third case the lung consolidated with tuberculosis was adherent to the pleural apex and subclavian vessels. Laterally directed adhesions were enucleated, but the infiltration by tubercles of tissues about the subclavian vessels prevented the lung apex from being freed. The cavity in this case had diminished in size, but the findings demonstrated the limitations of the operation. Treatment by artificial pneumothorax had been continued in all three cases.

Mr. F. J. HENRY thought there was scope for preliminary thoracoscopy in these cases; some of the adhesions might be suitable for closed division, and this could only be determined by such investigation. He drew attention to the need for an absolutely airtight closure of the wound; otherwise the pneumothorax might become incompetent by leakage, the lung re-expand, and the adhesion become re-attached. It might be well to suture the cuff of enucleated pleura over the raw stump of the adhesion in an endeavour to prevent this. Dr. R. H. MICKS thought that no statistics came up to those of Maurer of Davos, whose results were really due very largely to his own skill. Mr. T. A. BOUCHIER-HAYES referred to two cases treated in a similar manner; one of these, in which the third and fourth ribs were resected, subsequently developed surgical emphysema. Dr. J. B. MAGENNIS said that Mr. Clery's method opened up a new way of treating adhesions which could not be dealt with by thoracoscopy; he agreed that preliminary thoracoscopy would be wise. He thought that there was a definite danger of surgical emphysema.

Mr. CLERY, in reply, said that he had not meant to decry the great value of thoracoscopy, but had brought forward the subject merely to show that the open operation could be performed if necessary. He did not think that surgical emphysema would be a very serious complication. He had had radiographs taken after operation to control the position of the lung.

Low-voltage X-Ray Therapy

Dr. R. STUMPF read a communication on a new method known as Chaoul's contact treatment, or low-voltage *x*-ray therapy. It aimed at using *x* rays under conditions which as nearly as possible approached those obtaining in the application of radium. After explaining how this was achieved, he dealt with the procedure of treatment, and made general observations. The indications for this method were all easily accessible cancers. Out of thirty-five cases of surface carcinoma in which the treatment was completed twenty-five cases were clinically healed, a result which could never have been obtained with deep *x*-ray therapy.

The president, Mr. SETON PRINGLE, said that Dr. Stumpf had not laid any stress upon the treatment of secondary deposits. In tongue cases radium did a great deal of good, but the results of treatment of the cervical glands were very bad. The local treatment of epitheliomata was very good in its way, but it was only attacking one end of the process. He had had many cases of rectal cancer treated by deep *x* rays after colostomy, but knew of only one good result; 75 per cent. of rectal cancers were inoperable, and if this contact treatment could do any good it would be a new weapon.

Dr. R. M. CORBET remarked that cases of cancer of the vulva were usually unfavourable for irradiation owing to some peculiarity of the skin. Mr. F. J. HENRY referred to the combination of surgery and radium implantation in cancer of the anal canal. He had had cases of epithelioma of the lip which responded very well to *x*-ray treatment. Dr. PILKINGTON said that the indications for this treatment were practically the same as for radium: the growth had to be accessible.

Dr. STUMPF, in reply, said that when dealing with massive tumours he tried to have them levelled down with diathermy before starting *x*-ray treatment. It was possible to treat twenty areas in one sitting. With contact treatment one could deal with very large infiltrating tumours to which, so far, it had not been possible to apply radium.

CHOICE OF THE ANAESTHETIC

At a meeting of the Manchester Medical Society on December 4th, 1935, Professor A. D. MACDONALD opened a discussion on the choice of the anaesthetic. He said that this choice involved at least three decisions: the type of anaesthesia; the anaesthetic drug; and the drug or drugs for premedication, if any. The ideal local or general anaesthetic had yet to be discovered, but its theoretically desirable properties from the point of view of patient, surgeon, and anaesthetist might be enumerated. Only the volatile anaesthetics possessed the controllability which made possible the adjustments for varying needs and susceptibilities. The action of mixtures of aliphatic compounds was the sum of the actions of the components; there was no evidence of potentation, such as existed for morphine and other alkaloids followed by anaesthetics. The use of combinations, such as A.C.E. and Schleich's mixture, in which the volatilities of the drugs differed widely, was pharmacologically unsound. Premedication with non-volatile drugs introduced problems of dosage, and experience had shown that these could only be justifiably administered in doses well below the average anaesthetic dose. There was room for much work on the precise location in the nervous system of the action of these non-volatile drugs; thus, some might affect vital centres before they depressed ordinary reflexes.

Dr. G. FAULKNER HILL stressed the desirability of as accurate an estimation as possible in all grave risks where time allowed; to that end he invoked the aid of the surgeon, physician, and biochemist in addition to the anaesthetist. When this estimation of the survival power of the patient had been made, the next step was to enhance that survival power to the utmost by suitable preparation, diet, rest in bed, and appropriate treatment; only then should the patient be submitted to operation. The result of the surgical intervention, with details of the anaesthetics used, should come before, and be considered by, the men responsible for the advice and treatment given before operation. In this way a co-ordinated, and as far as possible unbiased, opinion would be formed in the course of time of the merits of the various methods in common use, which would presumably be of inestimable benefit to patients and a guide to all concerned. The organization of such a service would seem to call for the appointment of a special officer.

Mr. GARNETT WRIGHT discussed a small personal experience of splanchnic anaesthesia based on eight operations for gastrectomy—five for carcinoma and three for gastric ulcer; and five operations of gastro-enterostomy—three for ulcer and two for carcinoma. All these operations had been followed by an easy convalescence with no chest complications. The only drawback was that in two patients suppuration of the abdominal wound occurred; in one, the obvious cause was a haematoma. Though no real conclusions could be drawn from such a small series, the post-operative well-being of the patients raised the hope that chest complications might be much reduced, palliative gastrectomy for carcinoma might be undertaken with safety more often, and the operation for acute haemorrhage might be rendered safer.

CORRESPONDENCE

Testimonial to Dr. E. Rowland Fothergill

SIR,—For over thirty-three years Dr. E. R. Fothergill has been prominent in British Medical Association affairs, and there are few members of the Association who are better known to those who take an interest in it.

First in Wandsworth, then in Brighton, he has been an indefatigable local worker. For twenty-two years he has been a member of the Representative Body, for twenty-five years on the Council, and for twenty-two years a representative on the Panel Conference.

It is impossible in the limits of this letter to detail the extent and importance of Dr. Fothergill's voluntary services to the medical profession through the Association, but his work on the Insurance Acts Committee and on the body which preceded it, and also on the Hospitals and Medico-Political Committees, stands out pre-eminently. It was he who suggested and promoted the first conference of Local Medical Committees at Brighton in 1913, which led to the adoption by these committees of the British Medical Association as the body to which they should look for central organization and support. His fertility of ideas, his persistence, and his loyalty to principle and to the interests of the Association have justly given him a unique position in it, which was recognized in 1931 by his election as a vice-president. His advocacy at all times of the dignity and the rights of the medical practitioner is well known.

In recent years he has been compelled by reasons of health to give up general practice, and this has severely strained his resources. This seems to us, therefore, an appropriate time to give the members of the profession an opportunity to mark in a tangible way their appreciation of Dr. Fothergill's work and of the sacrifices he has made in doing that work.

We hope for a prompt and generous response to this appeal, not only from individuals, but from Local Medical and Panel Committees. Subscriptions should be sent to the Treasurer, Fothergill Testimonial Fund, B.M.A. House, Tavistock Square, W.C.1.—We are, etc.,

HELEN BOYLE (Hove)
A. C. GEMMELL (Hove)
DONALD HALL (Hove)
H. NETHERSOLE FLETCHER (Hove)
L. A. PARRY (Hove)

J. ARMSTRONG (Ballymena, Antrim)
J. W. BIGGER (Dublin)
R. A. BOLAM (Newcastle-on-Tyne)
J. W. BONE (Luton)
H. B. BRACKENBURY (Hendon)
R. C. BUIST (Dundee)
A. H. BURGESS (Manchester)
A. COX (London)
H. G. DAIN (Birmingham)
DAWSON OF PENN (London)
J. D'EWART (Manchester)
W. MCADAM ECCLES (London)
C. E. S. FLEMMING (Bradford-on-Avon)
N. BISHOP HARMAN (London)
C. O. HAWTHORNE (London)
E. KAYE LE FLEMING (Wimborne)
EWEN MACLEAN (Cardiff)
HUMPHRY ROLLESTON (Haslemere)
H. S. SOUTTAR (London)
W. E. THOMAS (Ystrad-Rhondda).

Fractures of the Spine

SIR,—Mr. S. T. Irwin, in his stimulating paper on fractures of the spine (*Journal*, January 4th, p. 1) refers to many interesting problems, and one is tempted by his most courteous criticism to discuss all of them. I would be glad, however, if I might be allowed to comment on only one. In considering the treatment of crush fractures with injury to the spinal cord, Mr. Irwin says:

"Watson Jones's method of retaining plaster on patients completely paralysed . . . has also been criticized. Even in patients unparalysed the prevention of bed sores is attended with some difficulty, and with a patient paralysed it would appear to be almost impossible."

Two types of pressure sore must be differentiated. The ulceration which may occur over the kyphos must be described as a "plaster sore." It is due solely to the pressure of a ridge of plaster, and it occurs whether the patient is recumbent prone, recumbent supine, or ambulant. This sore develops with no greater frequency in the paralysed patient, because the level of anaesthesia rarely extends as high as the kyphos. It may usually be avoided by applying a large thick pad of felt, cutting a smaller window over the felt, and filing down the sharp edges of the window on the deep surface.

The ordinary bed sore which is seen over the sacrum and iliac spines is not a plaster sore but a "decubitus sore," due to the weight of the patient resting for a long period on one area of skin and subcutaneous tissue. It will develop whether the patient lies on plaster or on a water-bed, provided only that the patient is heavy enough and that he is left long enough. This sore develops wherever there is weight-bearing; the least discouraging example I have seen was in a patient paralysed from the waist downwards, who developed them beneath the soles of both feet! It is clearly true to say that such weight-bearing decubitus sores are more difficult to avoid in the paralysed than in the unparalysed patient. But it is not true to say that they are more difficult to avoid in the paralysed patient treated in plaster than in the paralysed patient not so treated. On the contrary, the fact that the spine is immobilized in plaster makes it easier to turn the patient frequently and painlessly. Moreover, the careful moulding of the plaster to the outline of the trunk distributes the pressure more evenly. For these reasons decubitus sores occur less frequently when a plaster jacket is applied than when it is not applied. It must also be remembered that large sacral and iliac bed sores which have developed after prolonged recumbency from whatever cause are admirably treated by applying vaseline gauze and a plaster jacket or spica. Whether the primary condition has been a septic arthritis, a fracture of the lower limb, or of the pelvis or spine, healing of the pressure sore is accelerated by the application of plaster, which equalizes pressure and facilitates turning of the patient every two or three hours (or in the case of heavy patients every hour). Many such sores three or four inches in diameter have completely healed by the no-dressings plaster method.

The treatment of these cases is often disappointing, but the disappointment arises not so much from the difficulties of technique as from the frequency with which the cord has been irreparably damaged. While I agree, therefore, with Mr. Irwin that it is not always possible to avoid decubitus sores, I would urge that the plaster jacket should not be unjustly blamed, and that while there is any chance of recovery of the cord injury bone pressure should be avoided by maintaining hyperextension.—I am, etc.,

Liverpool, Jan. 13th. R. WATSON JONES.

Maternity Emergency Service

SIR,—This Service, which I advocated in the *British Medical Journal* in 1929, has been organized and is in active operation at Newcastle-upon-Tyne, and has since been adopted by several other health authorities. It is designed to meet the needs of cases suffering from severe shock or loss of blood. It is not easy to deal with such in a good-class home, but it is well-nigh impossible in a working-class dwelling. The usual procedure is to send for an ambulance to take the patient to hospital, but this means delay and upset, and not infrequently the patient's life is lost. The Service supplies a nurse and a complete outfit packed in sterile drums and containers of such things as blankets, hot bottles, dressings, drugs, instru-

ments, and apparatus for saline transfusion. A specialist is also available if asked for.

The medical officer of health for Newcastle, Dr. Charles, has notified the doctors of the procedure to adopt. A telephone message is sent to the Maternity Hospital giving the name of the doctor and the name and address of the patient. On receipt of the message the hospital authorities telephone for a taxi to take the nurse and outfit to the patient's house. If a specialist is named he is rung up and given the patient's name and address, but if the specialist asked for is not immediately available the others on the panel are telephoned in turn until one is secured.

A recent trial was made of the Service, and the nurse and the specialist were in the patient's home within fifteen minutes of the emergency call reaching the hospital. One life has already been saved by means of these first-aid measures. The expense entailed in organizing and in running such a service is trifling.—I am, etc.,

E. FARQUHAR MURRAY, M.D.,
Newcastle-upon-Tyne, Jan. 12th. F.R.C.S., F.C.O.G.

The Poisons Rules

SIR,—What would appear to be the final draft of the Statutory Rules and Orders dealing with the sale and supply of drugs which in certain doses are poisons has just been issued by the Home Office. There is a material difference, which affects the medical profession, in Rule 29 of the new draft as compared with Rule 27 in the previous draft, both of which specify categories of persons authorized to sell or supply the poisons named in the schedules attached to the Rules. The revised version dealing with medical practitioners, in Rule 29, enacts that the substances which such practitioners can supply are to be limited to certain glandular products cited in the Rule. If that Rule is accepted as part of the Act, which is to come into full operation on May 1st, 1936, the medical practitioner will be debarred from supplying preparations containing any of the poisons scheduled—a long list including many drugs commonly used—unless he is, or becomes, a member of the Pharmaceutical Society or a Fellow or Associate of the Institute of Chemistry. But this Rule would appear to conflict with Section 19 of the Pharmacy and Poisons Act, 1933, on which these new Rules are founded and beyond which they cannot legally go. That Section specifically excludes registered medical practitioners from the operation of the restrictions laid down in the Act for other sellers of poisons. It is probable that the new Rule as it stands is *ultra vires* and cannot be enforced, but it is obviously important to the medical profession that this position should be cleared up with a view to withdrawal of the Rule.

The editorial on the Poison Board Recommendations in the *Journal* of July 6th, 1935, deals, of course, with the previous draft, in which medical practitioners stood on an equal footing, as regards the supply of poisons, with members of the Pharmaceutical Society and Fellows or Associates of the Institute of Chemistry, and consequently no reference was made in that editorial to Rule 27, which is the forerunner of Rule 29 in the new list. The very short reference to the final report of the Poisons Board in the *Journal* of January 4th, 1936, makes no mention of this new and important restriction.

A memorandum covering three typewritten pages, issued by the Home Office to certain "bodies teaching chemistry" who have protested against the exclusion of graduates in chemistry, states that the new Rules are confined in their scope to "medicinal products" containing poisons; it is all the more extraordinary that medical practitioners should be deprived, as the new Rule would require, of their present right to compound or supply medicines containing drugs so commonly used as, for example, the barbiturates.

The universities are organizing a protest against the restrictions placed by Rule 29 upon university graduates in chemistry. It is clearly absurd that the certificate of an Associate of the Institute of Chemistry should entitle its holder to manufacture chemical poisons used in medicine when a Doctor of Science in Chemistry (for example, of London University) would be precluded from doing so. It is equally absurd that a registered medical practitioner should be required to take the M.P.S. or F.I.C. or A.I.C. if he wishes to dispense a mixture containing any of the scheduled drugs. I submit that the British Medical Association should join the universities in making the protest against the provision in Rule 29 as it now stands with its serious curtailment of the professional liberty of the registered medical practitioner.—I am, etc.,

London, Jan. 8th. E. GRAHAM-LITTLE.

Explosions in Operating Theatres

SIR,—In the résumé of the memorandum of the Ministry of Health on explosions in operating theatres, published in the current *Journal* (January 11th, p. 74), no mention is made of explosions other than those caused by anaesthetic vapours. Since at least two such explosions have occurred recently, one of which proved fatal, the matter is of some importance.

It seems insufficiently realized by some surgeons that if the skin is sterilized with ether or spirit or preparations containing these compounds, a layer of inflammable vapour will remain in contact with the skin for some minutes. If one looks along the skin surface this layer can actually be seen shimmering, owing to refraction. It follows, therefore, that if a diathermy knife is used for the incision before the inflammable vapour has had time to disperse a conflagration or explosion may easily result.—I am, etc.,

London, N.W.8, Jan. 11th. C. LANGTON HEWER.

Infections on Pleasure Cruises

SIR,—Dr. J. R. B. Hern contributes one more to the considerable number of cases of illness contracted on "pleasure cruises." So far as my own experience goes the list now includes malaria, dysentery, sandfly fever, and the enteric group. Of these dysentery has been responsible for the greatest number of victims.

I have been trying to point out for over a year that pleasure cruising is not without risk, especially when "during the cruise visits will be arranged to places of interest ashore." I believe most of the cases in my own experience were contracted ashore; but not all. Dysentery, fortunately often of a mild bacillary type, has arisen from passengers eating fresh green salads, the ingredients of which were purchased, with other supplies, ashore in ports like Alexandria, Port Said, and other places in the Mediterranean. Fresh strawberries, usually of most tempting appearance, are equally dangerous unless cooked. Promiscuous meals taken ashore may be a fruitful source of trouble. Only those who have been behind the scenes can know of the different standard of cleanliness observed in a restaurant from that prevailing in the kitchen where the food is prepared. I remember a series of typhoid cases occurring among the visitors to a hotel of world-wide repute. On investigation it was discovered that all the victims had used a certain table. The waiter in charge of this table was found to be a typhoid carrier.

At the end of a long and tiring day ashore it is very pleasant to sit on a hotel verandah in the evening and partake of liquid refreshment before returning on board. This is the time of day when the anophelines go on duty,

and the annoying bites one is liable to get around the ankles may be the prelude to an attack of malaria some days after returning home.

The interest of many of the places visited lies in their primitiveness and the manners and customs of their inhabitants. As one "cruiser" expressed it: "It is just like going back to Biblical times." The sanitary arrangements, water supplies, methods of cooking and storing food, and conceptions of culinary and personal cleanliness are equally rudimentary, except in absolutely first-class hotels. Flies abound everywhere, and carry in their crops and on their legs samples of the material on which they last fed—which was, not infrequently, human faeces. Everybody will be well advised to see that any liquids they drink are from freshly opened bottles bearing well-known brands bottled in the country of origin. Most pleasure cruisers are ignorant of even elementary precautions, having been brought up in this country, where the standards of public health are carefully preserved and safe drinking-water may be obtained from almost every tap. Very few of them have ever had to think for themselves about these matters.

I have just destroyed the manuscript of a small handbook of advice to travellers, and especially to "pleasure cruisers," because every publisher I approached said there would be no sale for it. An article on the same subject was promptly rejected by the editor of a well-known travel paper. I can understand the necessity for not prejudicing bookings by letting it be known that unless simple precautions are taken there is a definite risk.—I am, etc.,

H. M. STANLEY TURNER,
Wing Commander, R.A.F.

Ashtead, Surrey, Jan. 5th.

Oleothorax for Tuberculous Empyema

SIR,—Please allow me to reply briefly to Dr. G. S. Erwin's patronizing letter in your issue of November 9th, 1935. It is strange how much ink and paper are wasted because of errors in hearing or writing, which may result in the omission of small but important prefixes such as "un-." My alleged remarks at the discussion on tuberculous empyema at the B.M.A. meeting were not submitted to me for correction or approval. About oleothorax I actually said that the Brompton Hospital experience was *un*favourable, but that reports from other sources were more encouraging. Dr. Erwin speaks of oleothorax as "abandoned therapy": he may learn in time that what is abandoned at one hospital may find favour at others, and the impartial observer may find it hard to discover where the truth lies. Furthermore, it has happened that some form of treatment which has been abandoned at a given hospital may later be revised and found useful at the same hospital, though not necessarily by the same persons. The trite references to the "immiscibility of oil and water," and to "experience born of practice," require no comment in this year of grace 1935, or rather 1936 by the time you receive this letter.—I am, etc.,

M. P. SUSMAN.

Sydney, N.S.W., Dec. 19th, 1935.

Treatment of Asthma by Irradiation

SIR,—The paper by Dr. George Day, in the *Journal* of January 4th, on the treatment of asthma by ultra-violet light, was of special interest to me, because for many years I also have been using another form of radiation—*x* rays—for the relief of patients suffering from this disorder. I have chosen my words carefully, as it would be most unwise to use the word "cure" in such a connexion. To keep patients symptom-free for months, sometimes for years, is, however, a usual result when *x* rays are correctly applied.

I do not claim that my results have been better or more rapidly attained than those recorded by Dr. Day. What I wish to point out is that effects of the same general nature as those produced by ultra-violet rays may often follow the use of *x* rays of medium voltage in small doses spread over a wide field. (The thorax is not included in the field.) The *local* effects of *x* rays have been studied intensively almost since their discovery, but investigation of their *indirect* action has only just begun (see *Brit. Journ. Radiol.*, June, 1935, viii). It does not follow, of course, that *x* rays necessarily produce their constitutional effects in the same manner as ultra-violet light. Dr. Day seems to think that pigmentation is necessary to get his results. This is certainly not the case when relief of asthma by *x* rays is concerned, as the small doses necessary to obtain results produce no visible alterations in the skin.

I am interested in Dr. Day's theory that ultra-violet light causes changes in the chemistry of the skin, changes that indirectly affect the adrenals, because I myself believe that the benefit obtained by *x*-ray treatment in asthma is, at least in one important group of case, due to action on the adrenals. It is at any rate certain that, while ultra-violet light cannot penetrate to these glands and can therefore act on them, if at all, only indirectly, *x* rays can reach them easily and in some quantity. It is essential to make use of this fact in determining one's therapeutic technique. During the past two years it has been possible to demonstrate the general effect of this method of wide-field radiation objectively by means of the differential sedimentation test, which records definite changes in the blood serum. The serum shows a characteristic change in asthma and in certain other diseases, and it is often possible to bring back a normal reaction by suitable *x*-ray treatment. I consider the test of great importance, as it can be used to read the effects of any kind of treatment, and it would be very interesting to know if the serum passes through the same phases in cases treated on Dr. Day's lines.

One might truly say there is no such thing as asthma—only asthmatic patients. In dealing with such patients one cannot have too large an armoury from which to choose therapeutic weapons. I doubt if all cases will respond to light; I know that all do not benefit from *x* rays. Possibly in the more obstinate a combination or alternation of these methods might prove more effective than either separately.—I am, etc.,

S. GILBERT SCOTT.

London, W.1, Jan. 10th.

SIR,—I have read Dr. G. H. Day's article on the treatment of asthma by ultra-violet irradiation with much interest (*Journal*, January 4th, p. 8). I note that although he records the relief of symptoms in twelve cases of asthma, he makes little reference to similar cases which have failed to respond to this treatment. I agree that ultra-violet rays applied to the normal white skin and producing a full erythema reaction will, at times, greatly relieve the symptoms of asthma. However, in other cases, the identical technique producing a similar skin reaction fails to relieve the patient's symptoms. I am at a loss to explain this irregularity of results. In cases where there is evidence of active pharyngitis I have applied a water-cooled quartz mercury vapour lamp to the mucous membrane of the fauces and pharynx. In other cases of chronic asthma I have exposed the patient's blood to the rays of the mercury vapour lamp and re-injected 10 c.cm. of the irradiated blood by the intramuscular or intravenous route. By all these methods some 40 per cent. of patients have benefited rapidly and have been free from symptoms. The remainder have had no benefit whatsoever. The clinical results which I have so far obtained would not, however, permit of a critical

statistical investigation. But it is interesting to note that some cases respond well to ultra-violet irradiation when applied to the normal white skin, to the mucous membrane, or to the blood, but other cases of similar clinical types fail to improve.

Although these irregular results cause perplexity the method of treatment should be encouraged in the hope that it may be successful.—I am, etc.,

London, W., Jan. 6th. ALBERT EIDINOW.

Monkey Malaria for G.P.I.

SIR,—In the interesting article by Dr. C. E. van Rooyen and Dr. G. R. Pile, in the *British Medical Journal* of October 12th, 1935 (p. 662), on the treatment of general paralysis by ape malaria, it is stated that among the advantages of this method over the usual treatment by the *Plasmodium vivax* (human benign tertian malaria) are:

1. That the *Plasmodium knowlesi* does not suffer progressive attenuation in virulence as compared with *P. vivax*.
2. That 7½ grains of quinine dihydrochloride given intramuscularly will cure a patient of a massive infection.

In Australia, at least, these alleged advantages are non-existent, as proved by our experience at the Callan Park Mental Hospital, Sydney. At this hospital a patient was infected artificially with *Plasmodium vivax* on April 10th, 1926, and this strain has been transmitted through 135 series of human hosts by artificial induction, not only without any attenuation of virulence, but rather with an increase in infectivity and action, shown by the fact that the patients last infected showed a rise of temperature higher than during the first cases, rising in fact to over 106° F. and producing, if anything, greater clinical improvement. Its therapeutic action is also unimpaired, as the same percentage of patients sent back to work, or otherwise improved, is still maintained after nine years of artificial induction. It has also been found experimentally that one oral dose of 5 grains of quinine sulphate will completely and permanently cure some of our cases of the infection, indicating that it is more easily cured than the ape malaria quoted by the Rosslynlee investigators.—I am, etc.,

CLIFFORD HENRY, M.B., M.S.
Deputy Medical Superintendent.

Mental Hospital, Rozelle, N.S.W., Nov. 21st, 1935.

Use of Ephedrine-Glucose-Gum Solution

SIR,—Some six months ago I suggested a routine for the treatment of the post-haemorrhagic state (*Journ. Obstet. and Gynaecol. British Empire*, 1935, xlii, No. 5, 852), which included the intravenous infusion of ephedrine-glucose-gum solution for the severe cases. I continue to receive letters asking why I favour this treatment in preference to blood transfusion, which gives such satisfactory results. The following extract from a contribution read before the Newcastle and Northern Counties Medical Society in November, 1935, gives my reasons.

"I should like to make my attitude upon this point quite clear. I approve of, and practise, blood transfusion when definite indications are present, but, as a preliminary life-saving measure in the severe cases, I carry out an intravenous infusion of ephedrine-glucose-gum solution, whether or not a blood transfusion is to be carried out later. About three hours will elapse before a suitable blood donor can be obtained and the preliminaries for a blood transfusion can be carried out, while in hospital the ephedrine-glucose-gum infusion can be commenced within five minutes of making the decision that this treatment is necessary."

—I am, etc.,

Newcastle-upon-Tyne, Jan. 13th. WILLIAM HUNTER, M.D.

Fire-walking

SIR,—The joint article by Professor Waterston and myself upon Fijian fire-walking, although not published until December 28th, 1935, was written by us on board ship early in September, within a few days of our joint observations at Fiji on August 29th. Thus, when our MS. was sent to you for publication on our return to England in November, we were unaware that similar and more elaborate fire-walking observations (reported in the *British Medical Journal* on September 28th, 1935, p. 586) had been carried out on a Kashmiri Indian, Kuda Bux, by Mr. Harry Price, honorary secretary of the University of London Council for Psychical Investigation, first in collaboration with Professor J. A. Gunn of Oxford and the late Dr. W. Collier, together with two physicists, Messrs. C. R. Darling and T. E. Banks, and also at a second demonstration a week later, in conjunction with Professor C. A. Pannett of St. Mary's Hospital, again in association with Mr. Darling. The genuine character of the fire-walking is unimpeachable. The Indian performer on repeated occasions walked with bare feet during periods of over four seconds, taking four successive paces within that time, on a surface of red-hot embers and glowing charcoal at a measured surface temperature of 800° F., so that a piece of ordinary writing paper dropped upon it ignited at once. The performer's feet were examined and found to be cool, both before and after the fire-walking. No erythema or blistering occurred, whilst a 5/8-in. square of sticking plaster attached by Professor Pannett to the sole of one foot was not scorched. On the other hand, the feet of two control European volunteers, Mr. Digby Moynagh and Mr. Maurice Cheepen, each of whom took two paces in the burning embers, were severely blistered and required medical attention.

These independent observations strongly corroborate my own view that the phenomena are induced by the influence of suggestion in an atmosphere of emotion and religious exaltation.

Within the last few days a non-medical observer, Mr. C. F. Harrison of Watford, has written to me informing me that about the year 1908–9, at the time of the New Zealand Exhibition, when he himself was a schoolboy, one of his schoolmates in Wanganui, named Sukuna, was a Fijian chief or Ratu. Mr. Harrison writes as follows:

"A party of fire-walkers came over to New Zealand to give a demonstration. Sukuna visited the exhibition and was told by the fire-walkers that as a 'Ratu' or prince he had the power to walk as well as they. Sukuna was always a sportsman, so he took off his boots and stockings and walked the stones. He could not account for it; said the stones felt intensely hot, but did not burn. At that time his feet would be just the same as those of any other schoolboy. Incidentally, the fire-walkers brought their own stones over with them."

Miss Rosita Forbes, the distinguished explorer, in her recent book *Women Called Wild* (Grayson and Grayson, London, 1935), gives a vivid description of similar fire-dancing in the jungle tribes of Dutch Guiana. The celebrations usually occur at the full moon.

The Surinam Indians, a tribe of mixed negro and Indian origin, occasionally collect groups of individuals, men and women, who, after preliminary intensive drum-beating, chanting, and dancing, so as to induce the required degree of excitement and ecstasy, carry out fire-dancing. During the ceremony the performers not only walk and dance in the flames of blazing wood, but also scoop up red-hot embers with their hands, thrusting them into the axillae and between the thighs, pouring them over their head and hair, and even taking them into the mouth. At their leader's word of command they suddenly cease. Miss Rosita Forbes scrupulously examined several of the performers immediately after-

wards. Their skin showed no sign of burning, nor was there any smell of singeing.

This South American fire-dance is undoubtedly a form of religious ecstasy. The religious ceremony is presided over by a fire priestess, specially selected and trained, who stands in the middle of the fire but does not herself dance. The orgy, as described by Miss Rosita Forbes, displays obscene sexual characteristics, details of which she duly recounts:

"Where a blaze sank, men and women flung themselves on their faces in the attitude of those drinking from a stream. Embers dripped from their mouths. They pressed burning matter into their nostrils and ears. Maddened by their own immunity, they sought to destroy it, crunching the burning wood in their teeth and forcing white-hot cinders between their buttocks. . . . The women, who had been chanting in the shadows, now kneeled among the embers, scooping up ash and smearing it on the points of their breasts. Their heads were doubled backwards, their stomachs jerked. With cries and long-drawn gasps they reproduced at once the supreme culmination of ecstasy and the death-rattle."

All the foregoing observations indicate that painless fire-walking is not a matter of habitual exercise or daily training by the performers, but a specially prepared ceremony reserved for unusual occasions, whereby complete, though transient, insensitiveness to painful stimuli, thermic and otherwise, is induced.

Dr. A. G. Thompson, in his interesting letter published in your issue of January 11th (p. 86), raises an important question which I personally am unable to solve—namely, the nature of the psycho-physical process whereby painful thermic and other stimuli are tolerated, not only with indifference to pain on the part of the performer, but also without evoking the ordinary tissue reactions, such as local erythema, necrosis, or blistering. He also recalls the well-established fact noted by other competent observers (myself included, if I may venture to do so) that not only red-hot stimulation, but also painless and bloodless transfixion of the limbs, cheeks, etc., can be carried out, under conditions of auto-suggestion or hetero-suggestion, in surroundings of religious emotional ecstasy. In one group of Mohammedan dancing dervishes in Tunisia some years ago, who exhibited in my presence the phenomena of bloodless transfixion, I observed that immediately after each man's performance the chief priest or head dervish of the party quickly drew the excited performer to one side and, embracing him round the neck, whispered for several minutes fervently into his ear a communication apparently of a calming or comforting nature. I had no opportunity of examining the skin after these transfixions, but I am confident that no bleeding occurred.

Dr. Thompson asks whether we had any conversation with the Fijian performers. Unfortunately, neither Professor Waterston nor myself spoke or understood the Fijian language, so that conversation was impossible in the few minutes at our disposal. All that we could elicit, through an interpreter, was that some sort of preliminary religious ceremony took place in the reed-covered hut immediately before the fiery ordeal.

I have not yet personally witnessed the phenomena of "Yoga" ecstasy to which Dr. Thompson refers, although I have read descriptions of it. The insensitiveness during the Yoga ecstasy, however, as described by various European observers, appears strictly comparable to the above-mentioned phenomena. In the meantime I am in entire agreement with Dr. Thompson that one's duty is to keep an open mind, not only as to the observed clinical facts, but also as to the mechanism of their production. The influence of emotional stimuli upon other tissues besides the brain can hardly be doubted. After all, an emotion is not a mere psychical reaction, but a perception of our involuntary visceral and other reactions to particular events or situations. Many bodily emotional reactions can be verified objectively, so that an outside observer may be able to recognize by clinical observation (of the heart-beat, the colour, temperature, and sudomotor activities of the skin, the salivary and lachrymal reflexes, the size of the pupils, the tonus and tremor of skeletal muscles, the intestinal and vesical reflexes, etc.) whether a given individual is experiencing emotions such as fear, surprise, or anger. Mild degrees of insensitiveness to painful stimuli during emotional excitement are familiar to everyone, and it is but a logical step to the more profound degrees of analgesia as above described, accompanied by abnormal tissue reactions. It is perhaps noteworthy that these marked degrees seem to be attained more easily and with greater intensity in African, Asian, or Polynesian individuals than in those of European stock.—I am, etc.,

London, S.W.1, Jan. 13th. J. PURVES-STEWART.

Voluntary Euthanasia

SIR,—Dr. Killick Millard is to be congratulated on the formation of the Voluntary Euthanasia Legalization Society and the prospect of achieving his aim to relieve suffering. Yet there is one proposal, as set out in the *British Medical Journal* (November 2nd, 1935, p. 856), which appears unwise—that is, that the medical attendant should kill the sufferer.

To this I am strongly opposed. I have said elsewhere, Australasian Medical Congress (B.M.A.), Hobart, January, 1934 (*Transactions*, p. 162):

"If the magistrate be quite satisfied his permission should be granted to the patient himself, or to a kinsman agreeable to undertake the sad duty, or, in the last event, to a State official. In no circumstances should a medical practitioner be required or invited to perform the office. Whenever any such suggestion is made to a medical man he should reply that it is his duty to preserve life, not to take it. Any slightest lapse from this strict attitude would tend to undermine the confidence with which at least the majority of members of the public place themselves in the hands of their doctors, knowing that they may rely on them to save and not to destroy."

—I am, etc.,

Sydney, N.S.W., Dec. 11th, 1935. GUY GRIFFITHS, M.D.

SIR,—The report of the inaugural meeting of the Voluntary Euthanasia Legalization Society as it appears in your issue of December 14th, 1935, calls for very serious comment. Apart from the moral aspect of the case, which is the most important aspect, there are many other considerations. What is an "incurable disease"? By what standards can doctors decide when a disease is incurable? Doctors frequently differ. That is a matter of hard fact. Some diseases that were incurable fifty or a hundred years ago are now curable. What might be regarded as incurable now may well be curable fifty or a hundred years hence—even five years hence. Who will limit the progress of the noble science of healing that ours is, and where will the inevitable officials and experts draw the line between "curable" and "incurable"?

According to your report, Lord Moynihan accused Dr. Hawthorne of making the "unworthy" point that doctors were capable of making mistakes. That, Sir, is a most worthy point. One of the greatest services we can pay to our profession is to realize that we can make mistakes. At present the doctor is regarded as a healer,

a preserver of life. That is the fundamental concept in the minds of the patient and of his friends. The doctor is eagerly awaited with the hope, not that he will put the man out of pain, but that he will put the pain out of the man. This new society aims at putting the man out of existence. Let us make no mistake about this; the change is so fundamental that it will reach much further than even we contemplate, and the whole status of the profession will be altered in the minds of the people.

The promoters of this measure may talk about the free consent of the sufferer. How often do we not see in the law courts cases of contested wills on account of "no valid consent," "undue influence," etc. What a vista of such possibilities arises when the easy death expert gets busy! What of the rich uncle with an "incurable disease," whose very much interested nephew only wishes for his uncle's death in order to see the "poor man's sufferings terminated"? What of the disappointed relatives who might very well ask, What fee does the doctor get? The possibilities are really terrifying.

My objections to the proposed Bill are: (1) Its aims are definitely against the law of God. (2) Physical pain and mental suffering are not necessarily evils—often they are not evils, when looked at from the right angle. (3) Our mission of healing and of trying to preserve life is radically opposed to the idea of the doctor becoming even a "mercy killer." (4) Safeguards leave me cold, and it does not matter how many experts and officials sign "on the dotted line." But the main objection to this pernicious measure must be that it is an offence against the law of God. We medical men—or most of us—love our profession. The joy of healing is an intense happiness; it brings us nearer to the Great Healer. We are jealous of the dignity conferred by our title "doctor," and every doctor knows that there are already enough shadows in the sick-room without adding that of the lethal chamber. —I am, etc.,

Belfast, Jan. 6th. PHILIP J. MCGARRY.

SIR,—I have noted with interest the suggestion made by Dr. A. F. Tredgold (*Journal*, January 4th), and supported by Dr. J. S. Manson (January 11th), that a full inquiry into the question of voluntary euthanasia and the proposal to legalize it should be made by an appropriate medical committee. Unfortunately, the president of the Voluntary Euthanasia Legalization Society (Lord Moynihan) is at present abroad, and will not be back until March, but I have consulted the chairman of the Executive Committee (Mr. C. J. Bond), and he authorizes me to say that he feels sure our committee would welcome such an inquiry as being a wise and proper preliminary procedure. For although this question is not, strictly speaking, a medical one, yet it has such important medical bearings that without the co-operation of members of the medical profession our proposals could scarcely go forward.

May I add a word with a view to clearing up a misapprehension. It has been urged in opposition to voluntary euthanasia that it is the part of the doctor to prolong life, not to shorten it. That may be true, in a general sense, as applied to the medical profession as a profession, and especially to the curative branch of it. But there are many who hold medical qualifications who are not practising as doctors. It is quite possible that not many doctors in actual practice would think it desirable to take out a licence to administer euthanasia. But there should be a sufficient number not in practice who, actuated by motives of compassion, would be willing to do so.—I am, etc.,

C. KILLICK MILLARD,
Honorary Secretary, Voluntary Euthanasia Legalization Society.

Leicester, Jan. 11th.

Birth Control in Modern Life

SIR,—Statistics just published by the Registrar-General show that the national birth rate has declined to the lowest recorded level, being now 14.4 per 1,000 population. The slack tolerance of such a racial decline is folly. The strength of our population is a vital matter. It is not one for the shorter-sighted views of municipal authorities and birth extinction enthusiasts. There is little to support the thesis that birth control is the cure for unemployment; rather may it be expected that national and international embarrassments will fall to the lot of a shrunken people which has lost faith in itself. It is time for the control of birth control.

If a fair and proper sense of family security could be obtained, a prevalent reason for the very small family of to-day would be removed. It is possible that a measure of protection for the children of healthy parents, applied through insurance companies, might be usefully directed to the strengthening of our nation.—I am, etc.,

GEORGE H. ALABASTER, M.D.,
F.R.C.S.Ed.

London, W.1, Jan. 13th.

The Services

HONORARY SURGEON TO THE KING

Lieut.-Colonel A. J. H. Russell, C.B.E., I.M.S., has been appointed Honorary Surgeon to the King, and has been promoted to Brevet Colonel, vice Colonel C. A. Gill, I.M.S. (ret.).

HONORARY SURGEON TO THE VICEROY

Lieut.-Colonel J. Taylor, D.S.O., I.M.S., has been appointed Honorary Surgeon to the Viceroy and Governor-General of India, vice Lieut.-Colonel A. J. H. Russell, C.B.E., I.M.S., vacated.

DEATHS IN THE SERVICES

Lieut.-Colonel Abani Mohan Ghosh, I.M.S., died at Allahabad on October 24th, 1935, aged 46. He was born on July 26th, 1889, and was educated at Edinburgh, where he graduated M.B. and Ch.B. in 1915. Immediately afterwards he joined the I.M.S. as a temporary lieutenant, on February 19th, 1916, and on November 1st, 1920, received a permanent commission, ranking as captain from May 29th, 1917. He was promoted to lieutenant-colonel on August 19th, 1935. He served during the war of 1914–18, in Iraq in 1917–18.

Lieut.-Colonel Phineas Barrett Villiers-Tuthill, R.A.M.C. (ret.), died on November 11th, 1935, aged 85. He was born at Wexford on November 4th, 1850, and was educated at Trinity College, Dublin, where he graduated A.B. in 1871, and M.B. in 1874, also subsequently taking the Diploma in State Medicine in 1885, and the F.R.C.S.I. in 1886. Entering the Army as surgeon on February 4th, 1877, he became surgeon lieutenant-colonel after twenty years' service and retired on February 24th, 1897. When on the retired list he was employed at Chichester from 1899 to 1907. In 1908 he assumed the name of Villiers-Tuthill, by deed poll dated December 15th, 1908, his name having previously been Tuthill only.

Lieut.-Colonel William Albert Morris, R.A.M.C. (retired), died at Caerleon, Monmouth, on December 31st, 1935, aged 78. He was born on March 1st, 1857, and was educated as King's College, London, and in the Edinburgh Extramural School, taking the L.S.A. in 1879, and the L.R.C.P. & S.Ed. in 1880. Entering the Army as surgeon on February 4th, 1882, he became lieutenant-colonel after twenty years' service, and retired on March 1st, 1912, after which he was employed on the retired list at Scarborough. He served in the Burma campaign of 1886–7, was mentioned in dispatches in the *London Gazette* of September 2nd, 1887, and received the Frontier medal with two clasps; and in the Tirah campaign on the North-West Frontier of India in 1897–8, as secretary to the Principal Medical Officer, was mentioned in dispatches in the *London Gazette* of April 5th, 1898, was present at the capture of the Sampagha and Arhanga Passes, and received the medal with a clasp. He joined for service in the war of 1914–18, from March 17th, 1915.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a congregation held on December 19th, 1935, the following medical degrees were conferred:

M.B., B.CHIR.—D. G. Allen.
B.CHIR.—R. Anderson (by proxy), C. W. Thomas.

The title of the degree of M.B. was conferred by diploma in December on Mrs. M. H. D. Gunther.

UNIVERSITY OF LONDON

The following have been recognized as teachers of the University in the subjects indicated in parentheses:

London Hospital Medical College: Dr. James Davidson (Forensic Medicine).

Middlesex Hospital Medical School: Mr. Philip Wiles (Orthopaedics).

Charing Cross Hospital Medical School: Dr. Norman Swift Plummer (Medicine).

King's College Hospital Medical School: Dr. Archibald Gilpin (Medicine).

Professor C. R. Harington, Ph.D., F.R.S., has been appointed acting director of the Charles Graham Medical Research Laboratories for one year, from October 1st, 1935, and Dr. A. M. H. Gray, chairman of the Graham Legacy Committee for 1935–6.

Professor B. A. McSwiney, Sc.D., M.B., has been appointed to the University Chair of Physiology tenable at St. Thomas's Hospital Medical School from April 1st, 1936.

Examinations

In and after 1936 the written portion of the examination in anatomy at the Second Examination for Medical Degrees, Part II, will consist of two papers of three hours' duration, each paper to contain five questions, of which candidates will be required to attempt four; the regulations for internal and external students (*Red Book*, 1935–6, p. 275; *Blue Book*, September, 1935, p. 258) will be amended accordingly.

The regulations for the Second Examination for Medical Degrees, Part II, have been amended by the deletion of the words "Tuesday following the" in the second and third lines of the first paragraph on page 275 of the *Red Book*, 1935–6, and on page 258 of the *Blue Book*, September, 1935.

In and after 1938 a candidate entering for the Higher School Examination with a view to exemption from an Intermediate or First Medical Examination will be required to pay an entry fee of £6 6s. Candidates who are required to take a preliminary qualifying examination before proceeding to the examination for a First or Higher Degree or a Post-graduate Diploma will be charged the following fees: (*a*) if the qualifying test consists of part or the whole of an existing Intermediate or Final Examination, £1 1s. per paper or practical examination taken up to a maximum of £6 6s.; (*b*) if the qualifying test consists of a special *ad hoc* examination, £5 5s.

Celebration of Centenary of the University

The Senate has decided that the celebration of the centenary of the University this year shall take place in the summer, probably from about June 29th to July 3rd, when many academic visitors from over-seas are expected to be in England in connexion with the Congress of the Universities of the Empire and the Anglo-American Historical Conference. In connexion with the centenary a number of functions are contemplated, including the conferment of honorary degrees, a dinner and reception by the University, and a garden party. A service in St. Paul's is also contemplated, with a procession in academic dress to the Cathedral. It is hoped to obtain the co-operation of the schools of the University and other public bodies both in the entertainment of guests and in exhibiting the resources of the University to visitors; and special opportunities will be given to students both to take part in University functions and perhaps to arrange some function of their own.

Rogers Prize, 1936

Under the will of the late Dr. Nathaniel Rogers, the Senate offers from time to time a prize of £100, open for competition to all persons whose names appear on the *Medical Register* of the United Kingdom, for the best essay or dissertation on some medical or surgical subject to be chosen by the University. The prize will be next offered for award in 1936, and the subject named is "The Natural History of Peptic Ulcers." Essays or dissertations, which shall be in English and either typewritten or printed, must be received by the Vice-Chancellor not later than April 30th. Copies of the regulations and further information may be obtained from the Academic Registrar.

UNIVERSITY COLLEGE

A course of ten public lectures on "Comparative Physiology" will be delivered by Mr. G. P. Wells in the zoology theatre, University College, Malet Place, W.C., on Tuesdays, at 5 p.m., from January 21st to March 24th. The lectures are open without fee or ticket to students of physiology and zoology and others interested in the subject. There will also be a practical course in comparative physiology, for a limited number of students only, on Fridays, from 11 a.m. to 5 p.m., beginning January 24th.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

Mr. H. M. Traquair will deliver two lectures on perimetry at University College Hospital Medical School on February 10th and 11th, at 5.30 p.m. The chair at the first lecture will be taken by Mr. Percy Flemming.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

The following special lectures, open to medical practitioners and medical students, will be given in the Public Health Division: January 22nd, 3 p.m., Dr. W. G. Savage, "Bovine Tuberculosis"; January 31st and February 7th, 11 a.m., Mr. H. E. Magee, D.Sc., "Nutrition"; February 5th, 10th, and 12th, 3 p.m., Colonel L. W. Harrison, "Venereal Disease"; February 14th, 11 a.m., Dr. A. G. Maitland-Jones, "Infant Feeding"; February 21st, 11 a.m., Dr. W. G. Savage, "Food Poisoning"; March 9th, 3 p.m., Dr. J. W. H. Eyre, "Shellfish and the Public Health."

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College, held on January 9th, with Sir Cuthbert Wallace, the President, in the chair, a report was received from the board of examiners in anatomy and physiology for the Fellowship stating that, at the examination held in December, 228 candidates were examined, of whom seventy were approved and 158 rejected.

The Hallett Prize, granted at the above examination, was awarded to Robert Sutherland Lawson of the University of Melbourne.

At the recent Primary Fellowship Examination held in Calcutta fifty-four candidates were examined, of whom twelve were approved.

Appointments

It was reported that Mr. F. H. Bentley and Mr. David Slome had been appointed Mackenzie Mackinnon Research Fellows for one year.

Mr. Hugh Lett was appointed as Bradshaw Lecturer for the year 1936, and Dr. George W. Corner, professor of anatomy in the University of Rochester, U.S.A., was appointed as the next Thomas Vicary Lecturer.

Mr. L. R. Braithwaite was appointed as the representative of the College on the Medical Advisory Committee of the British Health Resorts Association for one year, and Mr. Victor Bonney was re-elected as representative on the Central Midwives Board.

A Diploma of Fellowship was granted to Kenneth Christie Eden of University College Hospital.

Diplomas

The following diplomas were granted jointly with the Royal College of Physicians:

TROPICAL MEDICINE AND HYGIENE.—W. K. Cheng, A. D'Souza, J. S. Gibson, K. Mitra, V. T. Vagh.

PSYCHOLOGICAL MEDICINE.—J. L. Bates, A. J. Galbraith, J. F. Galloway, S. L. Last, S. A. MacKeith, W. H. McMenemey, K. R. Masani, J. A. Smeal, A. Torrie, Rosalind Vacher, J. H. Watkin.

LARYNGOLOGY AND OTOLOGY.—B. T. Bernstein, G. B. Ludlam, R. F. J. Martin, N. Srinivasan, T. G. Swinburne, W. E. Williams.

The following hospitals, with the post specified, were recognized for the six consecutive months' post of resident house-surgeon, or other responsible post in charge of general surgical patients in the wards of a general hospital, required of candidates before admission to the Final Fellowship Examination: Warneford, Leamington, and South Warwickshire General Hospital (resident house-surgeon), up to July 31st, 1937. Manchester Victoria Memorial Jewish Hospital (resident surgical officer). Newcastle Hospital, N.S.W. (resident medical officer, first house-surgeon, surgical registrar, and medical superintendent). Southend-on-Sea General Hospital (surgical registrar, first and second house-surgeons). Sunderland Royal Infirmary (resident medical officer, first, second, third, and fourth house-surgeons). Wolverhampton Royal Hospital (resident assistant surgeon and surgical registrar, first, second, and third house-surgeons).

Obituary

RONALD GEORGE CANTI, M.D.
Clinical Pathologist, St. Bartholomew's Hospital

The death of Dr. R. G. Canti at his home at Hampstead, on January 7th, after a long and painful illness, was briefly announced in our news columns last week.

Ronald Canti's name and work in cinema photomicrography is known to thousands of people all the world over, but comparatively few men knew Canti well. He was somewhat reserved and very shy, but once this reserve was pierced there was no more loyal friend or delightful companion in this world. One of his most striking characteristics was the fact that he was always ready to help his colleagues and friends in any problem in which they were engaged. This was no mere superficial offer of help, but he would throw himself into the problem heart and soul, and bring to it a completely new line of thought. On many occasions this entailed an entire revision of the work, because Canti could never be satisfied with anything less than perfection.

Born in 1883 Canti was educated at Charterhouse and King's College, Cambridge. He qualified as M.R.C.S., L.R.C.P. in 1911, took the M.B. degree in 1915, and proceeded M.D. in 1919. He was a very keen rifle shot, and was captain of the Charterhouse eight and shot for his University. After leaving Cambridge he went to St. Bartholomew's Hospital, where he was house-physician, and there he entered on his career as a pathologist. At that time he was working under the late Sir Frederick Andrewes, professor of pathology at St. Bartholomew's, who was one of the first to recognize Canti's genius. At the time of his death he was clinical pathologist at the hospital.

The work on cinema photomicrography was started in conjunction with the late Dr. T. S. P. Strangeways, who had perfected the technique of tissue culture. Ronald Canti, whose knowledge of scientific matters was very wide, was able to help Strangeways in demonstrating mitochondria and other internal structures of living tissue and cells by dark-ground illumination. The next step was to see the effect of radium on the cells and particularly on the internal structure. For this purpose Canti designed a thick lead incubator for the protection of the observer, but, even so, it was a very tedious business to watch through a microscope for hours on end the changes going on in these cells. It then occurred to Canti that it should be possible to make a cinematographic record of these changes. The first piece of apparatus he constructed in his own house largely out of material he had at hand in his workshop. The success of this first film was so great that the British Empire Cancer Campaign gave him a more finished machine, made to his own design, with which he did his subsequent work. A few days before his death two of the films on which he had been working were shown by a colleague at a meeting of the Pathological Society of Great Britain and Ireland. One of these dealt with psittacosis and the other with the growth of tumours of the brain. This in itself shows the value to medicine of this new method of research. Apart from research there is little doubt that cinema photomicrography has a very valuable place as a method of teaching, and gives the student a much clearer idea of what is taking place in animal tissue than could be obtained from stained slides and textbook diagrams. Ever since Strangeways's death in December, 1926, Canti had worked in close conjunction with the present members of the Strangeways Laboratories, and he showed wonderful films of the growth of bone, chick embryos, rabbit ova, etc.

Apart from his work as a pure pathologist in the hospital, Canti's greatest interest was in the problem of malignant disease. It was largely due to him that a million-volt *x*-ray machine is being installed at St. Bartholomew's, and he spent hours in designing the department which is now being built. In 1928 he was given the Roentgen Award for the best paper of the year.

During the last few years Canti took up, with his characteristic vigour, work in connexion with the British Empire Cancer Campaign, and became its honorary scientific secretary. The value of his work there is well known to every member of that organization. Some years ago, when the possibility of a blood transfusion service was being considered, Canti's advice was sought, and he acted as scientific adviser to the British Red Cross Blood Transfusion Service until his death. Among his other appointments at the time of his death was that of bacteriologist to the City of London, medical officer of health to St. Bartholomew's Hospital, and pathologist to the Florence Nightingale Hospital. At the Annual Meeting of the British Medical Association at Nottingham in 1926 he was honorary secretary of the Section of Pathology and Bacteriology, and five years later, when the Association met at Eastbourne, he was vice-president of the same Section. During the Edinburgh Meeting in 1927 he showed to enthusiastic audiences his film demonstrating the growth of normal and malignant cells. His earlier papers on bacteriological subjects appeared in the *Journal of Hygiene* and the *Quarterly Journal of Medicine*. For the Nottingham Meeting of the B.M.A. he wrote in conjunction with Strangeways an article on dark-ground illumination of tissue cells cultivated *in vitro*, which appeared in the *British Medical Journal* of July 24th, 1926.

In 1912 Canti married Clare Eyles, who nursed him through his last long illness, which terminated in pneumonia. He leaves four children, of whom the youngest son is at present a student at St. Bartholomew's.

ALBERT ALEXANDER GRAY, M.D., F.R.F.P.S.

Late University Lecturer, Diseases of the Ear, and Surgeon for Diseases of the Ear, Western Infirmary, Glasgow

Otologists throughout the world will learn with regret of the death of Dr. Albert Gray on January 4th, following an illness of only a few days' duration. He had apparently been in his usual good health until, during a visit to relatives in Argyll, he developed influenza and acute abdominal symptoms, which demanded his hurried transference up Lochfyneside and over "Rest-and-be-thankful"—through scenes which he knew and loved so well—to a Glasgow nursing home, where he died the next day.

Born in Glasgow in 1869, he was educated partly there and partly at Bootham School, York. He studied medicine at Glasgow University, and obtained the degrees of M.B., C.M. in 1890 and M.D. in 1896, all with commendation. Having spent two years in general practice in Blackburn and a period in Munich studying oto-rhino-laryngology, he returned to Glasgow and began the practice of his specialty. His first hospital appointment was that of surgeon for diseases of the ear to the Victoria Infirmary. During the time of waiting and probation he became associated with the late Professor J. G. McKendrick, and together they wrote the chapters on the ear and vocal sounds for Schäfer's *Text-Book of Physiology*, which was published in 1900.

From an early period in his career he spent much time in making and photographing anatomical preparations of the ear, especially of the labyrinth. In order to secure the results aimed at much experimenting was necessary: new methods had to be devised and special apparatus constructed. The stereoscopic pictures finally obtained were of surprising beauty. A collection of these was published in 1907 and 1908 in two volumes entitled *The Labyrinth of Animals*. Two years later *The Ear and its Diseases* was produced—a book which appealed to both student and aurist because of its various original features and the excellent illustrations. Dr. Gray was a leading authority on otosclerosis, and in 1917 a volume from his pen dealt at length with the subject. With Mr. George Wilkinson he wrote *The Mechanism of the Cochlea*, which appeared in 1924. In the same year was published the first volume of what proved to be his magnum opus, entitled *Atlas of Otology*, illustrating the normal and pathological anatomy of the temporal bone. The second volume followed in 1933. This magnificent work, which must have demanded an immense amount of skill and labour, was received with acclamation by otologists at home and abroad. In the course of one of the many reviews it was stated: "No man has done more to maintain the standing of British otology in the scientific world than Dr. Albert Gray." In the meantime he had been appointed university lecturer on diseases of the ear, and surgeon for diseases of the ear to the Western Infirmary, and to the Cancer Hospital.

Gray's labours were recognized by his confreres, and did not pass unrewarded. In 1909 he gained the Lenval Prize in Otology. In 1911 he was Gold Medallist of the American Academy of Ophthalmology and Otology. In 1929 he received the Guyot Quadrennial Prize of the University of Groningen, and in 1933 he was recipient of the Dalby Memorial Award. He also held the following posts: president of the Section of Otology, Royal Society of Medicine, 1914–16; president of the Section of Otology at the Annual Meeting of the British Medical Association at Glasgow in 1922; president of the Collegium Oto-rhino-laryngologicum at the London Meeting in 1929.

At a comparatively early age Dr. Gray married Miss Mabel Henderson, who was well known in artistic circles in Glasgow and took some part in local government. Her death in 1927 led to his retirement from the University and from hospital and private practice, and he left Glasgow. In London he found solace in continuing his researches, for which an outstanding opportunity was offered by the liberal provision of equipment and material at the Ferens Institute of the Middlesex Hospital. Notwithstanding his highly successful scientific career he was modest and unaffected. Many of his high qualities may be attributed to his Quaker parentage.

Albert Gray was a lovable man, of a cheery and sociable disposition, and possessed of the quality of *politesse de cœur*. He had many friends at home and abroad. Outside his professional work he was interested in various forms of sport. He found great inspiration and delight in Shakespeare and in some of the byways of literature. Above all, he was a keen naturalist, and was happiest when on holiday on the shores of the sea lochs of Argyll. Throughout life and up to the last he preserved his youthful enthusiasms and in a large measure his physical activity. He is survived by his two sons: the elder is head master of Bootham School, York, and the younger is a doctor in Haslemere, Surrey.

A. B. K.

Dr. J. S. FRASER of Edinburgh writes:

By the death of Dr. Albert A. Gray British otology has lost its greatest scientist. Gray brought to his research work a mind well trained not only in the literature of his specialty but also in physics, comparative anatomy, physiology, and many other pertinent subjects. In his writings (for example, *The Ear and its Diseases*) Gray showed a charming literary style. It would take too long to give a list of all his research papers, but attention may be called to his work under four headings:

(1) Anatomy, development, and physiology of the organ of hearing. Gray published an atlas of otology and another beautifully illustrated work on the comparative anatomy of the labyrinth in animals—work which was made possible by his own ingenious method of dissolving away the bony labyrinth capsule, thus leaving the membranous labyrinth exposed to view through the almost transparent endosteum. Along with Wilkinson, Gray published a book on the mechanism of the cochlea, in which the Helmholtz theory of the peripheral analysis of sound received the strongest support. (2) The pathology of congenital deaf-mutism. Our knowledge of this subject has been greatly extended by Gray's research work. Here again he devised a method which combined the advantages of the celloidin and paraffin methods of section cutting, and enabled him to obtain remarkably thin sections of the cochlea. (3) During the last years of his life Gray contributed several important papers on the subject of tumours of the eighth nerve. (4) Otosclerosis. In the future Gray's name will be remembered especially for his work on this difficult subject. He recognized the importance and the appalling frequency of this disease long before the majority of otologists, who continued to talk and write about catarrhal deafness and to treat cases of otosclerosis by operations on the nose and throat. In 1917 Gray published his book on otosclerosis (idiopathic degenerative deafness). Later he described peculiar cases of the disease (otosclerosis paradoxus), in which the markedly deaf patient heard for a brief period almost as well as normal. In 1934 Gray published a further important paper on otosclerosis (*Journ. Laryngol. and Otol.*,

xlix, 629). In recognition of his scientific work Gray was awarded several important prizes, and was repeatedly elected to the presidential chair at British and international otological meetings.

[The photograph reproduced is by Elliott and Fry, Ltd.]

A. BLAIR AITKEN, F.R.C.S.

Consultant Specialist, Government of Nigeria

News has been received of the tragic death at Lagos, on December 8th, 1935, of Mr. A. Blair Aitken, F.R.C.S., Consultant Specialist to the Government of Nigeria. Member of the firm of Gray and Aitken, whose name is practically a household phrase throughout Nigeria, his death is an irreparable loss to the country. Mr. Aitken was a guest at one of the fishing and bathing parties arranged by Sir Walter Johnson, Director of Medical and Sanitary Services. When bathing it was noticed that he was in difficulties. The host, a powerful swimmer, at once went to his assistance, but in spite of the most determined efforts he was unable to get Mr. Aitken ashore or even rescue the body, which was carried away by the tide. Sir Walter continued his efforts until he almost lost his own life ; he was ultimately dragged ashore by a rope extemporized from towels knotted together by the rest of the party. Death was not due to drowning, but to a cardiac attack.

Andrew Blair Aitken, the eldest son of Andrew Aitken of Dalry, Ayrshire, was born on May 6th, 1882. Educated at Glasgow High School and Glasgow University, he graduated M.B., Ch.B. in 1905. He could have graduated in 1904, but refused to go up for his final to the astonishment of the men of his year. Those who knew him well knew that his knowledge of the subjects was well above the average ; he was working in close association with those who took high places in the 1904 pass list, but remained quite unmoved when they endeavoured to get him to sit for the examination. His argument was that there had been too much to learn in the last year, he considered his knowledge of the work too superficial, and he, quite apart from whether he could or could not pass the examination, had determined to give himself another year in which to revise and consolidate. This apparently minor incident is quoted as it gives the keynote of Blair Aitken's character. It was not enough for him to satisfy examiners or impress others. He had full knowledge of himself ; the standards he set for himself were higher than the ordinary, and he achieved them by the exercise of a determined persistence. It was this complete honesty and reliability that bred in his intimate friends and those patients whom he had seen through serious illnesses a comforting dependence on him to the extent that his loss makes them feel that one of the few stable props of their existence in this uncertain world has suddenly been knocked from under them.

Having taken his M.B., Ch.B. " with commendation " in 1905, he filled the posts of house-physician and then house-surgeon at the Victoria Infirmary, and from there went as house-surgeon to the Sick Children's Hospital, Glasgow. He later joined the anatomy department at Glasgow University under Professor John Cleland, acting first as prosector then as demonstrator. During this period he passed his primary for the English Fellowship. He then went to London and studied at various hospitals, and got his F.R.C.S. in 1909. He continued the study of surgery, holding posts at the Tottenham Hospital, and later at the Throat and Nose Hospital in Golden Square.

In 1913 he married Miss Edith May Palmer, and bought a surgical practice in Sunderland. Before he had consolidated his position there the war broke out, and he joined the R.A.M.C. early in 1915, was posted to Lincoln and then Ripon, and went to France in June, 1915. He served there until the armistice, being appointed a surgical specialist, and working mostly in casualty clearing stations. He was demobilized early in 1919, and returned to Sunderland and the remnants of his practice. He was then asked by Dr. G. M. Gray to join him in partnership in Lagos, Nigeria, sailed later in the year, and from the time of his arrival the two partners did surgical and medical work of the highest order. Aitken's operative technique, developed by his extensive experience in the war, got full scope with ordinary general surgery and with the unusual and difficult type of chronic case, huge tumours, etc., only seen in a primitive country where medical work is in its infancy.

In addition to the Creek Hospital, built by Dr. Gray, there were in Lagos the older Government European and African hospitals. The buildings were out of date, and had become dilapidated. It was decided that the best arrangement would be to use their site for an enlarged modern African hospital, and if possible acquire the Creek Hospital, which was most excellently sited, and use it as a European hospital for both officials and non-officials. Gray and Aitken were approached, and early in 1925 an agreement was come to whereby the Government purchased their hospital and retained them to render domiciliary and hospital medical attendance to all Europeans resident in Lagos and its suburb Ikoyi and attendance at the hospital to all other officials who presented themselves there. Not long afterwards the Government invited them to join the staff of the new African Hospital as visiting specialists, and they assumed responsible charge of all the clinical work and operative surgery of a 200-bed hospital fully equipped on the most modern lines. One feature of the work at the hospital which interested Aitken greatly was the teaching of African medical students. Some five years ago a medical school was started at Yaba, a suburb of Lagos. The students are put through a course modelled on the home curriculum and receive their clinical training at the African Hospital, Lagos. After four years, if they can pass the necessary examination, they become medical assistants and proceed to spend two years in clinical posts as housemen under tutelage ; if satisfactory, they spend a further year in study, and are then admitted to the examination for a diploma which qualifies them for the Nigerian *Medical Register*. When so registered they will be entitled to the same privileges in Nigeria as a practitioner registered in Britain. The training of these men is pioneer work which will, if successful, be of the greatest benefit to the country. Blair Aitken was much interested in it, and his services in connexion with it were of the greatest value. His position in Lagos also gave him a specialized knowledge, so far as Nigeria was concerned, of various tropical diseases—plague and yellow fever, for example. His knowledge of the latter disease was enhanced by working in intimate association with members of the Rockefeller Yellow Fever Commission during the years they were in Lagos. He attended the Yellow Fever Conference at Dakar in 1928, and was presented by the French with the Silver Medaille des Epidemies in recognition of his contribution to the discussion.

Medicine in Nigeria will suffer severely by the loss of Blair Aitken's services, but even greater will be the sense of personal loss which very many Nigerians will feel. He had no suave bedside manner ; he was very silent and reserved, and to many of those who did not know him he appeared grim. He had no sympathy with any form of deception, and patients who, to serve their own ends, were not frank with him, had perhaps some reason so to regard him ; but anyone who was honest with him and any seriously ill patient could depend on understanding sympathy, and his manner with them was such as to inspire complete and soothing confidence in a quite unusual degree ; they were able to see the essential cheerfulness and boyishness of his real nature. J. W. T.

E. STARR JUDD, M.D., F.A.C.S.

Surgeon to the Mayo Clinic

The sudden death of Dr. E. Starr Judd of the Mayo Clinic at the comparatively early age of 57 comes as a great blow to the many friends and former assistants who knew and admired him as possibly the most dexterous American surgeon of this generation.

His story is one of hard work and unremitting devotion to the ideals established in Rochester by William and Charles Mayo. Born there in 1878, he returned after qualifying, and in 1902 joined the Mayo Clinic as surgical assistant to Charles Mayo. Judd was Mayo's most successful and distinguished pupil. Within a few years he became a partner in that great enterprise, and quickly established a reputation in surgery which the passing years served only to increase. The unexampled wealth of surgical material available in Rochester, combined with his natural gifts of hand and temperament, rapidly brought him to the forefront and enabled him to become without question the most able of all the outstanding surgeons that institution has produced. For many reasons Judd was always regarded in Rochester as being in a class apart. From 1904 onwards he maintained a prodigious surgical output, which became greater with the gradual relinquishment of active surgery by William and Charles Mayo. From 1920 onwards he in fact assumed the main surgical burden of the Clinic. The ideal surgeon, he was quiet, unassuming, and modest: his equanimity under all conditions was superb. He seemed to have brought the art of economy of movement to perfection, a characteristic as notable in his everyday life as in his operating. In many ways Judd had reduced his life to one of machine-like regularity, and it was undoubtedly as a result of this that he accomplished so much. His surgical judgement was magnificent, completely free from fads and fancies, and based on common sense, wide reading, immense experience, and the closest and most careful clinical observation. Delighting to correlate his surgical experiences in the operating room with the accurately observed result of animal experimentation, he spent one morning every week at the Institute of Experimental Medicine with F. C. Mann, where he observed and discussed the fascinating surgical problems undergoing investigation. His operative technique was noted for its purposeful progression, its consummate craftsmanship, its most deceptive swiftness, and its complete lack of so-called brilliancy. No single movement was unnecessary, and difficult dissections appeared absurdly simple beneath his dexterous hands. As chief of the surgical staff he had many onerous executive duties, which he discharged in that modest unassuming manner which endeared him to all his colleagues. His opinions were rarely given but always sought. He was greatly in demand at surgical meetings throughout the United States, and as a result his literary output covered a wide field. His chief interests lay in genito-urinary, gastric, and biliary surgery, and on these subjects he made numerous contributions.

Judd will be sadly missed by his colleagues at the Clinic, most of whom as former assistants were bound to him by ties of personal loyalty and deep affection. He had no enemies. A host of friends both in America and abroad admired his sterling qualities as a man and his technical perfection and finished craftsmanship as a surgeon. The Mayo Clinic itself has suffered a blow from which it will take long to recover. Surgery has lost one of its most notable exponents.

A. H. McI.

The late Dr. JEREMIAH REIDY was one of the truest and most faithful friends that the East End of London ever had. He received his early education in Cork, he studied medicine in the Universities of Edinburgh, Dublin, and Glasgow, and when he came to London he attached himself both to special hospitals and to the London Hospital to keep himself abreast of every change and advance in medicine. After taking the Scottish triple diploma in 1898, he graduated M.B., B.Ch. at the National University of Ireland in 1909, and gained the gold medal when proceeding to the M.D. in 1914. He also held the D.P.H. Dr. Reidy had a large panel practice and a large private practice. He carried out the difficult duties of police surgeon with probity and great acceptance. He was generous to the needy and indefatigable in his attentions to the sick in his surgery and in their homes. As he lay dying his mind often reverted to the many calls of the sick: the consciousness of their needs seemed the very last thought to leave his mind. He died on January 6th in his sixty-fifth year. The columns of the *British Medical Journal* have often reported the many public functions that he presided over. He was elected mayor of Stepney in the war years 1917–18. He was a clear-headed man in times of difficulty; fuss and panic were unknown to him: fidelity and uprightness were his outstanding characteristics. Among the consultants of London his reputation stood high as a man who spared no effort to get to the bottom of obscure illness. In medical benevolence he not only gave but assisted in the administration of medical charities. He had contributed his own observations to the medical press, and that a son should follow him in the profession was a great joy to his heart. He received in his last illness all the consolations of religion. Pneumonia, overwork, and treacherous weather combined, and we have lost a good doctor whose memory we shall cherish for many many years, and whose loss we grievously deplore.

W. J. O'D.

The death of Dr. JEFFERY ALEXANDER AMHERST ORLEBAR on January 2nd at Hove, after a very brief attack of pneumonia, came as a great surprise to his friends and patients. Dr. Orlebar had practised in the town for many years. He received his medical education at Cambridge and St. Thomas's Hospital, and graduated M.B., B.Ch. in 1905, taking also the English conjoint diplomas. He afterwards acted as house-physician and assistant pathologist and bacteriologist at the Royal Sussex County Hospital. Soon after starting practice in Hove the great war broke out and Dr. Orlebar received his commission as captain in the R.A.M.C. He served in Salonika, where he was appointed malaria specialist. Later he became medical officer in charge of tropical diseases at a Ministry of Pensions clinic. He was a member of the Royal Society of Medicine, of the Brighton and Sussex Medico-Chirurgical Society, and of the British Medical Association. He had served for some time on the Executive Committee of the Brighton Division and was one of the representatives of that Division at the Annual Representative Meetings held in Cardiff in 1928 and in Manchester in 1929. He had a special interest in the St. John Ambulance Association, of which body he was Divisional Surgeon. His funeral took place at Hassocks, and was attended by colleagues and patients, who mourned his loss at so early an age. He leaves a widow and three children, and to them the sympathy of all his friends and colleagues is sincerely offered.

The death is announced of Geh. Staatsrat Doctor of Medicine and Philosophy MAX VOLLERT, at one time curator of the University of Jena, on November 14th, at the age of 85; of Dr. ERNST ZIEMKE, professor of medical jurisprudence and formerly director of the Institute for Legal and Social Medicine in Kiel, on November 26th, at the age of 69; of Dr. CONSTANTIN BUCURA, professor of gynaecology and obstetrics in Vienna, at the age of 62; of Professor W. KIRCHNER of Würzburg on December 14th, 1935, at the age of 87; of Professor ALBERT JESIONEK, aged 65, who had for many years been director of the skin and venereal department of the University Hospital of Giessen; and of Professor STEFAN TOTH of Budapest, a prominent Hungarian gynaecologist.

Medical News

A meeting of the Chelsea Clinical Society will be held at the Hotel Rembrandt, Thurloe Place, S.W., on Tuesday, January 21st, at 8.30 p.m., when Sir Harold Gillies will open a discussion on "Plastic Surgery." The meeting will be preceded by a dinner at 7.30 p.m.

The next monthly clinical meeting for medical practitioners will be held at the Hospital for Epilepsy and Paralysis, Maida Vale, W., on Thursday, January 23rd, at 3 p.m.

A sessional meeting of the Royal Sanitary Institute will be held, in conjunction with the North-Western Branch of the Society of Medical Officers of Health, at Rochdale Town Hall on Friday, January 24th, at 5 p.m., when discussions on "The Housing Act, 1935," and "Municipal Baths and Water Purification" will be opened by Mr. Harry Bann and Mr. S. H. Morgan, respectively.

A meeting of the Medical Section of the British Psychological Society will be held at 11, Chandos Street, W., on Wednesday, January 22nd, at 8.30 p.m., when Dr. Sylvia Payne will give an address on "Post-war Social Activities and Advances in Psychotherapy."

The second meeting of the Association of Industrial Medical Officers will be held at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., on Friday, January 24th, at 5.15 p.m., and on Saturday, January 25th, at 10 a.m. Discussions will be opened on "Physical Standards in Industry," by Sir David Monro, and on "The Relation between the Industrial Medical Officer and the General Practitioner," by Dr. T. O. Garland.

Meetings of the Eugenics Society have been arranged as follows: at Linnean Society's Rooms, Burlington House, Piccadilly, W., Tuesday, January 21st, 5.15 p.m., Dr. S. Zuckerman, "The Physiology of Fertility in Man and Monkey"; at Waldorf Hotel, Monday, February 17th, 7.30 p.m., Galton dinner, and lecture by Mr. Julian S. Huxley, "Eugenics and the Social Environment"; at Linnean Society's Rooms, Tuesday, March 17th, 5.15 p.m., Mr. D. Caradog Jones, "Eugenics and the Merseyside Inquiry"; at Royal Society's Rooms, Burlington House, Piccadilly, W., Tuesday, May 19th, 4 p.m., Annual General Meeting, 5.15 p.m., presidential address by Lord Horder, "Eugenics as I See It"; at Linnean Society's Rooms, Tuesday, June 16th, 5.15 p.m., Dr. R. B. Cattell, "Is National Intelligence Declining?"

The Fellowship of Medicine announces that surgical tutorial classes will be given at the National Temperance Hospital at 8.30 p.m., on January 21st, thyroid; January 23rd, injuries to bones; January 28th, neck; and January 30th, skull and brain. Courses have been arranged as follows: proctology, at St. Mark's Hospital, February 3rd to 8th; neurology, at West End Hospital for Nervous Diseases, February 3rd to 8th; physical medicine, at St. John Clinic and Institute of Physical Medicine, February 8th and 9th; chest diseases, at Brompton Hospital, February 10th to 15th; gynaecology, at Chelsea Hospital for Women, February 10th to 22nd; and children's diseases, at Princess Elizabeth Hospital, February 22nd and 23rd. A series of lecture-demonstrations on anatomy and physiology, especially intended for primary F.R.C.S. candidates, will be given at Infants Hospital, at 8 p.m., on Mondays, Wednesdays, and Fridays, from February 24th to April 24th. Further particulars may be obtained from the Fellowship of Medicine, 1, Wimpole Street, W.

The fourth annual convention of the British Association of Chiropodists will be held at the Hotel Metropole, Northumberland Avenue, London, on January 31st and February 1st. The programme includes an address on the second day, at 3.45 p.m., by Dr. W. J. O'Donovan, on "The Future of Chiropody."

On December 3rd, 1935, Sir James Purves-Stewart was elected an honorary member of the New York Neurological Society.

A vacant Christie Pensionership of £89 per annum will be filled by the Epsom College Conjoint Committee on February 12th next. Candidates must be duly qualified medical men of not less than 55 years of age whose income, independently of any allowance from the Royal Medical Benevolent Fund, does not exceed £100 a year if single, and £150 if married. Forms of application can be obtained from the Secretary of Epsom College, 49, Bedford Square, London, W.C.1, and must be completed and returned by January 27th.

At a meeting of the court of the directors of the Society for Relief of Widows and Orphans of Medical Men, held on January 1st, with Mr. V. Warren Low, president, in the chair, the deaths of five members were reported, and five new members were elected. Four widows of deceased members applied for relief. A grant of £60 per annum was voted to each widow, and one over 65 received in addition £15 per annum. Two orphans also applied for relief, and were voted £50 per annum each. A sum of £2,082 10s. was voted for the payment of the half-yearly grants to the fifty-five widows and ten orphans in receipt of relief; £625 had been distributed as a Christmas gift. Widows over 75 years of age received £15 each, and those under 75 and the orphans £10 each. A legacy of £45 has been received from the executors of the late Dr. W. Culver James, who at the time of his death was a vice-president of the society. Relief is only granted to widows and orphans of deceased members left with a yearly income of £125 or under. Membership is open to any registered medical man who at the time of his election is residing within a twenty-mile radius of Charing Cross. Full particulars may be obtained from the secretary at 11, Chandos Street, Cavendish Square, W.1.

The issue of the *Journal de Médecine de Lyon* for December 20th is devoted to morbid anatomy, that of the *Journal Médical Français* for November to gastro-duodenal ulcers, and that of the *Journal of the American Medical Association* for December 7th to tuberculosis.

Messrs. H. K. Lewis and Co. are issuing a bi-monthly guide to the lectures on medical, scientific, and technical subjects, with dates and places of delivery, which are to be given in London. The guide for January and February will be sent on application to 136, Gower Street, London, W.C.1.

The "Ski Club Médical de France" has just been founded. Only doctors and medical students are eligible for membership. This club will study the medical and scientific aspects of winter sports and will organize excursions for its members. The address of the treasurer is Dr. Berthier, 1 ter Boulevard de la Saussaye, Neuilly-sur-Seine, Paris.

The King has conferred the Bar to the Order of Mercy on Colonel R. J. Blackham, C.B., C.M.G., C.I.E., D.S.O., M.D., the president of the League of Mercy.

Dr. M. L. Barst has been elected chairman of the Public Health Committee of the Stepney Borough Council.

Professor Hartmann has been elected President of the French Academy of Medicine for 1936, having been its vice-president in 1935. Dr. Maurice Villaret, professor of therapeutical hydrology and climatology, and Dr. G. Jeannin, professor of clinical obstetrics in the Paris Faculty of Medicine, have been elected members.

Professor A. Czerny, who was for many years director of the Berlin University Children's Clinic, has been offered the chair of paediatrics and the direction of the Children's Clinic at Düsseldorf.

Mr. Cecil Rowntree has been elected a member of the Executive Committee of the International Union against Cancer, of which the next Congress will be held at Brussels in September next.

Professor P. Nolf of Liége has been elected president of the Belgian Royal Academy of Medicine for 1936.

During the first forty-four weeks of 1935 9,992 cases of poliomyelitis were notified in the United States, as compared with 6,759 in the corresponding period of 1934.

A German society for investigations on nutrition was founded at the Public Health Office of the Reich by the President, Professor Reiter, on December 16th, 1935.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

The **TELEGRAPHIC ADDRESSES** are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin).

QUERIES AND ANSWERS

Treatment of Dipsomania

"M.D." writes: I would be glad to have suggestions for the treatment of a man of 36, married, with two children, who for the past few years has been subject to attacks of dipsomania, occurring about every eight or nine weeks and lasting anything from a few days to a fortnight. During this period he drinks nothing but whisky, in quantity up to two bottles a day. In the intervals he is very abstemious, but during the attacks he is quite incapable of work, though normally he is a very alert business man. His father was subject to similar attacks, which, however, were of shorter duration, came on later in life, and did not incapacitate him for so long. I saw this patient in the middle of his last attack, and gave him grain 1/10 of apomorphine hypodermically, repeated on two occasions, without, however, causing any nausea or distaste for alcohol. In fact, I felt his craving was aggravated thereby. He slept for some hours, and wakened with an increased desire, but eventually settled under large doses of chloral and bromides. I would be glad to have suggestions: (1) to arrest the craving at the commencement of an attack, or (2) in the course of an attack. He is not suitable for institutional treatment in view of his abstemious intervals, and in any case he would not consent to this. Physically his condition is normal, apart from the usual effects of alcohol.

Psoriasis of the Scalp

Dr. HORACE ROSE (Wendover) asks for advice as to the treatment of a chronic but mild case of psoriasis of the scalp in a female patient aged 40. The usual remedies have been tried.

Income Tax

Official Quarters in Institution

"M. S." inquires as to the position of the official and the institution in the matter of income tax.

*** Where quarters are assigned to an official rent free and he is not permitted to sublet them the value of the benefit so received—that is, the equivalent of the rent, rates, and any other advantages supplied—is not assessable (Schedule E) on the official in accordance with the old rule laid down in Tennant *v.* Smith. On the other hand, if the official receives a gross salary less a deduction for rent, etc., he is liable on the gross and not on the net amount payable to him—Osborn *v.* Swyer. As regards the institution, the governing body is liable to assessment under Schedule A on the whole building (including the official quarters), unless it is exempt as a charitable body. In that case, however, the exemption does not apply to any portion occupied by an individual officer whose total income amounts to £150—Income Tax Act, 1918, Schedule A, No. vi, Rule 1 (*c*).

LETTERS, NOTES, ETC.

The Quintuplets and their Doctor

On May 28th, 1934, Mrs. Elzire Dionne, a young French-Canadian living in a settlement two hundred miles north of Lake Ontario, gave birth to five living girls. Dr. Allan Roy Dafoe of Callander arrived after the birth of two of the infants, but was present during the delivery of the remaining three, and took charge of the whole situation. He contributed a graphic account of the event to the *Journal of the American Medical Association* of September 1st, 1934, and this was briefly summarized in our issue of

September 22nd. The history of the five babies, ever since their birth "got into the papers," has been a subject of world-wide publicity. Dr. Dafoe, who received the O.B.E. in the Silver Jubilee Honours List, has been kind enough to send us, as a Christmas and New Year card, a charming photograph in colours of the "quins" and their doctor at play on the nursery floor, and we think that a good many readers will like to see a small reproduction of this happy domestic interior or conversation piece.

Urine as a Remedy

Dr. DAVID RORIE (Aberdeen) writes: Forty years ago, in the "Kingdom" of Fife, urine was frequently employed as a remedial application for the cure of "rose" (erysipelas), and a child's wet napkin was used often to wipe out the mouth and fauces of a sufferer from "thrush." Dan McKenzie, in *The Infancy of Medicine*, mentions that one of the stock drugs of the ancient Hindus was decomposing urine, and, although it has never come under my own observation, I have been told by patients of cases where the sufferer's own urine was taken as a remedy for "bladder trouble" and gonorrhoea.

Dr. ENID A. WILLIAMS writes: I knew an old Anglesey lady, a farmer's daughter born in 1835, who always kept a crock of sour urine in her garden. When washing flannels she used to mix about a pint of this with the water. Her flannels never shrunk, and were always soft. If a cow had paid a visit to a bull without becoming pregnant, she would blame her husband for refusing to give the animal a dose of the sour urine immediately on its return, stating that it was a never-failing remedy for sterile mating. Of course the urine from her crock was ordinary mixed urine. Warm fresh urine was a well-known remedy for chapped hands, about thirty years ago, amongst the lower classes.

Warning to Hospitals

Dr. SIDNEY CLARKE (St. Albans) writes: I would advise hospitals to beware of a man coming in as a casual and asking for immediate treatment, as an in-patient, for renal colic. Probably he will demand a private ward, and he may say that he is a Canadian. He has two scars in the right loin, one in the left, and there is one over the appendix region. He has tattoo marks on his arms, gives well-known names as references, and actually he has no means. He is a humbug, and wants simply a night's good board and lodging.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 50, 51, 52, 53, 56, and 57 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 54 and 55.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 32.